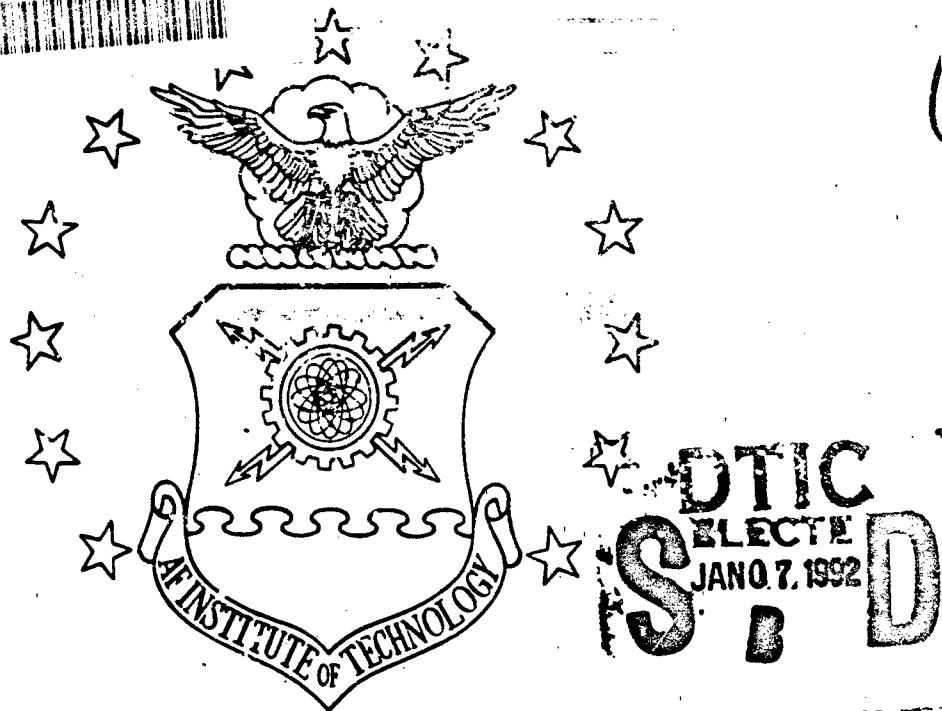


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**A VALUE-BASED HIERARCHY OF OBJECTIVES  
FOR MILITARY DECISION-MAKING**

**THESIS**

**Lowell A. Nelson, 1st Lieutenant, USAF**

**AFIT/GEM/LSR/91S-9**

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A VALUE-BASED HIERARCHY OF OBJECTIVES  
FOR MILITARY DECISION-MAKING

THESIS

Presented to the Faculty of the School of Systems and Logistics  
of the Air Force Institute of Technology  
Air University  
In Partial Fulfillment of the  
Requirements for the Degree of  
Master of Science in Engineering Management

Lowell A. Nelson, B.S.E.

First Lieutenant, USAF

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In writing about the moral value of human activity, one cannot avoid considering the source of good in the universe. I thank my Creator for giving me the ability to complete this effort, and hope that this work honors Him.

Lowell A. Nelson

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Abs tract

This study develops a rational model for the incorporation of ethical values into military decision-making. The values considered include obedience to superiors, professional competence, and elements of just war theory such as proportionality and discrimination. A review of the relevant literature on just war theory and professional military ethics points to the science of multiattribute utility analysis as a means of representing the complex value tradeoffs essential to military decisions. The values and tradeoffs identified are interpreted in a hierarchy of objectives model which is used to evaluate value preferences between decision alternatives. With the hierarchy constructed, tradeoffs between values such as preservation of life and preservation of just social order are explained graphically in terms of indifference curves and utility functions. The effect of organizational roles on the evaluation of tradeoffs is also explored in the context of the model. The relevance of the hierarchy is examined by applying it to a historical decision concerning the strategic bombing of Schweinfurt in World War II. This model is useful as an aid to the understanding of ethical dilemmas, and with little further development could be

integrated into a decision support system to aid in ethical decision-making.

A VALUE-BASED HIERARCHY OF OBJECTIVES FOR  
MILITARY DECISION-MAKING

I. Introduction

Military ethics forms the core for a profession that is engaged in a very special task sometimes requiring the sacrifice of human life as well as the deliberate taking of human life. Given the role of the soldier, it is clear that some code of values is necessary to give a human and humane dimension to the soldier's awesome tasks and responsibilities. (Gabriel, 1982: 23-34)

Richard Gabriel's justification for his extensive work on military ethics, To Serve with Honor, is also at the heart of this thesis. Every decision made in the military should be made with a profound respect for its moral dimension. Indeed, such awareness not only gives the military a "human and humane dimension," it is essential to performance: ". . . the effectiveness and success of a military force rests far more on the moral quality of its men than it does on technical expertise" (Gabriel, 1982: 7).

If we accept the essential nature of ethics in military decisions, the question naturally arises, "How do we incorporate ethical values into military decisions?" The multiple demands of the military for performance, obedience, and effectiveness seem to leave no room for the military member to contemplate ethical values. This thesis develops

a rational model for the incorporation of all these values into military decisions.

This chapter defines terms, explains the purpose of the model, introduces the motivation for the model, presents the problem statement, and outlines the remainder of the thesis.

### Definitions

The term ethics has been used already with the assumption that the reader has a general understanding of the term, but a concise definition is necessary. A very general definition of ethics is "the systemic study of right and wrong actions (Yezzi, 1986: 348). This definition can be expanded into three elements:

(1) Ethics deals with the directing of human actions through the consideration of issues such as values, obligations, character, and responsibility;

(2) It is an intellectual inquiry into the best way of directing human actions; and

(3) It is systemic in that some hierarchical order of importance for directing human actions emerges, the establishment of principles of action usually a high priority. (Yezzi, 1986: 348)

Applying this definition to the military environment, Gabriel defines military ethics as "the art of observing those moral obligations and precepts that are appropriate to a person's role within the military profession" (Gabriel, 1982: 29). These statements together reveal three salient points: ethics is an "intellectual inquiry" which uses human reason; ethics involves "principles of action," rather than

theoretical derivations; and ethical expectations are related to a person's role in an organization (or society). This relation to role is an important concept which will be explored in Chapter III of this thesis.

This definition of ethics refers to values, which can be separated into two types, extrinsic and intrinsic. "Intrinsic values refer to what is good in itself; extrinsic values (also called instrumental values) refer to what is good for the sake of some other purpose" (Yezzi, 1986: 349). Military actions are often situations where an action of low intrinsic value (killing a human being) has high extrinsic value (protecting freedom). This tension between extrinsic and intrinsic values provides the impetus for a decision-making model.

One way to classify ethical value systems is to reference the source of their principles. If the value of actions in an ethical system is based on the consequences of the action, then the system is teleological. Utilitarianism is an example of a teleological system which bases obligation on "the greatest good on balance for all involved in the action(s)" (Yezzi, 1986: 349). "If consequences are rejected in favor of some other principle such as the rightness of the act itself, or the duty to perform it" (Yezzi, 1986: 349), an ethical system is considered deontological. It is beyond the scope of this thesis to examine the source of the ethical principles used in the

decision-making model, but the model is useful regardless of the types of values involved.

This thesis will use the terms values, goals, and utilities interchangeably. Value is generally used for purely subjective descriptions, while goals and utilities are used when values are quantified for the purpose of decision analysis. The use of the term utility does not necessarily indicate the use of utilitarian principles. The decision analysis paradigm can be used whether values are deontological or teleological; it only requires that the decision-maker be able to state a value preference, regardless of its origin.

A further clarification of the definition of ethics used here is necessary: the ethical principles in this thesis are normative, meaning "the process of evaluation in order to arrive at the best principles for directing human actions" (Yezzi, 1986: 348) Thus, this thesis seeks to define ethical principles that should be, not necessarily those that are actually observed. However, decision model itself is prescriptive; that is, "the approach we take prescribes how an individual who is faced with a problem of choice under uncertainty should go about choosing a course of action that is consistent with his personal basic judgements and preferences" (Raiffa, 1968: x). To restate, this thesis will use normative ethical principles in the creation of a prescriptive decision-making model.

Because ethical decision-making is being prescribed, the word expect will appear in the discussion of the model, and bears definition. Expect refers to the way that people desire others to act as they themselves would act, and or hold the same values as they do. In the context of this thesis, it is an implicit reference to the existence of a normative consensus of values. To the extent a person should (or could) judge the morality of another's actions, an immoral action would not meet normative expectations and a moral one would.

These definitions provide the language for this discussion of ethics, and the following sections explain its motivation and purpose.

#### Motivation for the Model

This thesis began with the goal of analyzing the ethics of the doctrine of strategic bombardment. While strategic bombardment is a complex subject, it was assumed that a rational method existed by which to evaluate this military action.

The method initially proposed was a model developed by Captain Clark Bruce Kidd in his 1986 Master's thesis for the Air Force Institute of Technology. Capt Kidd proposed a graphical method for resolving the tension between intrinsic and extrinsic values in evaluating the morality of a military action. The model was a simple yet powerfully effective way of depicting this value problem. However, as

a method for decision-making, it did not fully represent all of the values involved in a military decision. Capt Kidd recognized the incomplete nature of the model in the final chapter of his thesis:

... the model has potential for expansion into additional dimensions through the incorporation of additional parameters such as management effectiveness, probability of success, and accountability or degree of responsibility for actions.

RECOMMEND: That future theoretical work be pursued to incorporate one or several of the potential additional parameters into a three dimensional model. (Kidd, 1986: 69)

This thesis follows Capt Kidd's recommendation, except for the development of a "three dimensional model;" problems in visualizing and constructing a three dimensional model were anticipated, so a two-dimensional hierarchy of objectives was chosen. This hierarchy lends itself to the inclusion of future parameters with minimal additional complexity.

#### Purpose of the Model

The ethical objectives model developed in this thesis creates a framework for intellectual inquiry, one which can lead to a clearer understanding of the principles of action for the military. Ward Edwards describes the advantages of the elicitation of utility (value) structures in social decision-making:

Multiattribute utility measurement can spell out explicitly what the values of each participant (decision maker, expert, pressure group, government, and so on) are and show how and how much they differ -- and, in the process, it can frequently reduce the extent of such differences. The exploitation of this technology permits . . .

public decision-making organizations to shift their attention from specific actions to the values these actions serve and to the decision-making mechanisms that implement these values. (Edwards, 1977: 249)

This statement refers to "public decision-making organizations," and the question arises if the military is truly a "public" organization, subject to the same values as other organizations. Gabriel addresses this issue:

To say that the military must serve the larger society is not the same thing as saying that the profession must be completely of that society . . . Given the special nature of the military profession and of its obligations and responsibilities, it is clear that a whole range of habits and values cannot be tolerated in the military either because they do not work or because they damage the nature of the profession itself. Thus, the protection of the society by the profession does not require that the profession become like the society. (Gabriel, 1982: 88)

Gabriel discusses the unique nature of the profession within the society at length, but the fundamental point is this: although subject to some of the values of society, the military has a unique set of values which may not coincide with those of the society at large, but are necessary to successfully defend the society (Gabriel, 1982: 88-92). Members of the profession will certainly benefit from efforts to clarify and define those values.

#### Problem Statement

The problem to be solved in this thesis can be stated as follows: "In making an ethical military decision, what factors must be considered, and how can they be combined in a unified decision-making model?" While it would be

presumptuous to say this question has been definitively answered here, the more realistic goal of providing a clear, simple framework for discussion of this complex problem has been accomplished.

#### outline

The remainder of the thesis will be divided into three main parts, with a chapter devoted to each part.

Chapter II is essentially a literature review, beginning with an introduction to the development of a multiple-value decision model. It will continue by describing Capt Kidd's thesis in more detail, and finally identifies the major parameters considered in military decision-making, to include a discussion of just war theory and professional military values.

Chapter III describes the development of the value hierarchy, incorporating the parameters identified in Chapter II. Parameters are added in a stepwise fashion for clarity, and the strengths and weaknesses of the hierarchy are discussed.

Chapter IV applies the hierarchy to a historical decision to evaluate its usefulness as a decision-making tool and as a context for the discussion of ethics.

Chapter V discusses further recommendations for development and validation of the model.

Summary

This chapter has defined terms, explained the motivation for the thesis, presented the problem statement, and outlined the remaining chapters.

## II. Literature Review

### Introduction

Individuals and organizations make decisions in order to attain particular ends. So it follows that a decision maker should evaluate alternatives in terms of the extent to which each alternative will lead to the attainment of these ends. Such ends, or goals, may be considered in terms of a hierarchy in which the goals at the top tend to be abstract . . . and the ones near the bottom tend to be concrete . . . (Macrimmon, 1977: 123)

Military decisions certainly involve multiple ends that require evaluation. One task of this thesis is to identify and arrange hierarchically those values which are important to the military organization. This chapter begins with a review of the paradigm of decision analysis which forms the basis of the hierarchy of objectives, then analyzes the previous work in this area from a decision analysis perspective, and finally identifies values which are morally and professionally important in military decision-making.

### Decision Analysis Process

Creation of a hierarchy of objectives is part of a paradigm of decision analysis which can be summarized in five steps:

PREANALYSIS. We assume that there is a unitary decision maker who is undecided about the course of action he or she should take in a particular problem. The problem has been identified and the viable action alternatives are given.

STRUCTURAL ANALYSIS. The decision maker structures the qualitative anatomy of his problem. What choices can he make now? What choices can he defer? How can he make choices that are based on

information learned along the way? What experiments can he perform? What information can he gather purposefully and what can he learn during the normal course of events without intentional intervention? These questions are put into an orderly package by a decision tree . . . . The decision tree has nodes that are under the control of the decision maker . . . and nodes that are not under his full control . . . . We refer to these two nodes as decision nodes and chance nodes.

UNCERTAINTY ANALYSIS. The decision maker assigns probabilities to the branches emanating from chance nodes . . . .

UTILITY OR VALUE ANALYSIS. The decision maker assigns utility values to consequences associated with paths through the tree . . . . In an actual problem, there would be associated with this [example] path various economic and psychological costs and benefits that affect the decision maker and others whom the decision maker considers as part of his decision problem. The cognitive impacts are conceptually captured by associating with each path of the tree a consequence that completely describes the implication of that path. The decision maker should then encode his preferences for these consequences in terms of cardinal utility numbers . . . the assignment of utility numbers to consequences must be such that the maximization of expected utility becomes the appropriate criterion for the decision maker's optimal action.

OPTIMIZATION ANALYSIS. After the decision maker structures his problem, assigns probabilities, and assigns utilities, he calculates his optimal strategy--the strategy that maximizes expected utility . . . . (Keeney, 1976: 5-6)

Because the subject of this thesis is the value analysis in the fourth step above, the other steps in the process will be de-emphasized. We assume in the preanalysis that we ultimately have one decision-maker in the military, and that only two action alternatives exist: to perform the action or not. This is certainly an oversimplification, but

allows a more complete discussion of the value problem. The structural analysis is also simplified by specifying a simple decision tree where one decision node exists for the decision maker. This renders the uncertainty analysis unnecessary, although it is recognized that a military decision might contain numerous chance nodes of uncertain outcomes. Again, the emphasis of this thesis remains on the specification of the value structure, which is addressed in the utility or value analysis. To "encode his preferences" and provide for "maximization of expected utility," the decision maker must establish a utility function which will reflect his values. This involves the establishment of objectives.

#### Hierarchy of Objectives

A rudimentary example in Keeney demonstrates the terminology used in identifying objectives. The example concerns a city where the air contains excessive levels of pollution. An area of concern for authorities would be "the threatened well-being of the residents of the city." An overall objective related to this area would be to "improve the well-being of the residents." Two "more detailed objectives" or lower-level objectives might be to "reduce the emissions of pollutants from sources within the city" and "improve the citizens' attitude toward air quality." The "emissions" objective might be further broken down into three more lower-level objectives: "reduce sulfur dioxide

emissions," "reduce emission of nitrogen oxides," and "reduce the particulate emissions." An attribute such as "tons of sulfur dioxide emitted per year" would indicate the "degree to which alternative policies meet" the objective of "reduce sulfur dioxide emissions." The pollution example illustrates the progression from areas of concern to attributes (Keeney, 1976: 32-33).

This progression suggests the hierarchy mentioned at the beginning of this chapter. Manheim and Hall call the hierarchy a "goal fabric," and suggest four types of relations that are identified in the formation of the hierarchy: "specification, means-end, value-wise dependence, and value-wise independence" (Manheim, 1968: 733).

Specification and means-end are a way to "clarify the vague, general statements that usually constitute goals" (Manheim, 1968: 733). Specification simply means "explaining in more detail what we mean by the general goal" (Manheim, 1968: 733). In the example above, "reducing emissions" and "improving attitudes" specify "improving the well-being of the residents." The means-end relation answers the "how" question:

The means-end relation describes how a goal can be accomplished . . . . In this case the means goal is important only because it is instrumental to achieving the end. This end can in turn be a means to another goal, forming a means-ends chain up to the intrinsic goals, the ones important to themselves. (Manheim, 1968: 733)

Continuing the example above, "reducing sulfur emissions" is a means of achieving the end of "reducing emissions." The

difference between specification and means-end relations is subtle, and even blurred by Keeney in his discussion (Keeney, 1976: 41), so "specification" will be used exclusively in this thesis to describe the general-to-specific relation.

The remaining relations of value-wise dependence and value-wise independence are clearly opposites:

Value-wise dependent goals are those that can be evaluated only in conjunction with other goals . . . Value-wise independent goals, on the other hand, can be evaluated on their own, without regard to any other goals. (Manheim, 1968: 733)

In the traditional terminology of ethics, we could refer to these value-wise dependencies as considerations of extrinsic and intrinsic value. An action has a value as an end in itself, or intrinsic value, but it also has value to the extent that it serves other ends, called extrinsic value. The intrinsic value of an action does not define it completely; its extrinsic value must also be considered. For example, killing soldiers on the battlefield, when evaluated solely with respect to the value of human life, might not be considered an acceptable alternative. However, if killing accomplishes a military objective which may lead to the preservation of the state (a desirable condition, presumably) then it might be considered an acceptable alternative.

This hierarchy description suggests multiple layers of objectives culminating in very specific attributes. This thesis will be limited to a general statement of objectives

with limited specifications because lower-level attributes will depend on the particular decisions being made.

MacCrimmon suggests three basic techniques for generating objectives: "examination of the relevant literature, analytical study, and causal empiricism" (MacCrimmon, 1969: 7). Relevant literature will be the principal method of objective generation in this thesis, but causal empiricism, or "observing people to see how, in fact, they are presently making decisions relevant to the problem" (Keeney, 1976: 35), will also play an important part. Anecdotal evidence will be sprinkled throughout this thesis to encourage the reader to compare the conclusions reached to his own experience.

#### Other Decision Model Terminology

This is a philosophical rather than mathematical study, but the understanding of some mathematical principles is necessary to appreciate the model and its ramifications. In addition, part of this thesis is a critique of Kidd's model, and its graphical conception suggests mathematical decision analysis principles which he did not fully address. Mathematical proofs and complex notation will be avoided when possible, and only the salient points of the theory will be presented.

Keeney summarizes the central issue of multivalue decision analysis under certainty, value-wise dependency:

Our problem is one of value tradeoffs. In this chapter we see what can be done about

systematically structuring such tradeoffs. In essence, the decision maker is faced with a problem of trading off the achievement of one objective against another objective. If there is no uncertainty in the problem, if we know the multiattribute consequence of each alternative, the essence of the issue is, "How much achievement on objective 1 is the decision maker willing to give up in order to improve achievement on objective 2 by some fixed amount?" (Keeney, 1976: 66).

Some explanation of the notation used in this discussion is necessary. To begin, we designate  $\underline{a}$  for each individual feasible alternative and  $\underline{A}$  for the set of feasible alternatives. Each alternative  $\underline{a}$  has a known outcome (because of our assumption of certainty) in the consequence space defined by attributes  $\underline{x}_1, \underline{x}_2, \dots, \underline{x}_n$ , where the  $n$  attributes have been identified previously in the hierarchy of objectives. Because these attributes are generally not in the same units, we cannot simply add them together. We need a scalar value function  $v$  defined in the consequence space which will combine the attributes  $\underline{x}_1(\underline{a}), \dots, \underline{x}_n(\underline{a})$  into a "scalar index of preferability." With this function defined, we can choose the alternative in  $\underline{A}$  which maximizes  $v$  and thus maximizes the preferability of the decision (Keeney, 1976: 67-68).

Numerical definition of this function for the attributes of a military decision is beyond the scope of this thesis. However, three important concepts about the attributes used in the function are essential for the reader to understand the remainder of this discussion:

indifference curves, marginal rate of substitution, and acceptable attribute values.

Indifference Curves. An indifference curve (shown in Figure 1) is simply a curve on the graph of two value-wise dependent attributes along which the decision-maker has no

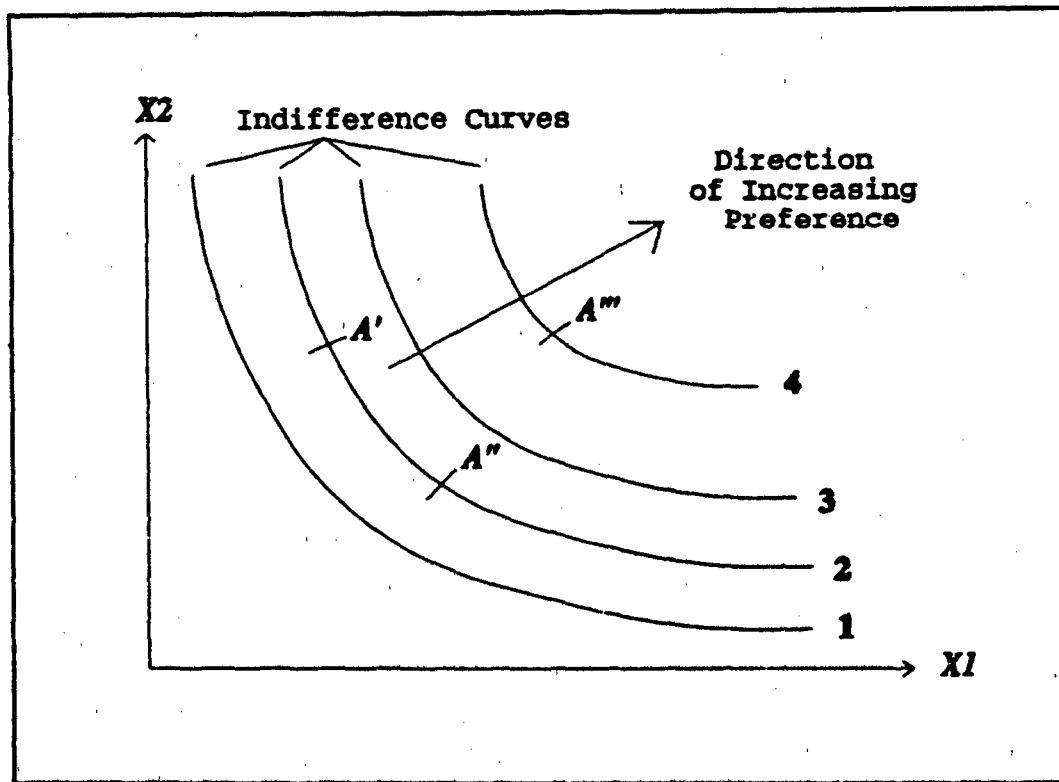


Figure 1. General Indifference Curves (Keeney, 1976: 79)

preference. Another way of stating this is to reference the initial quotation above: the indifference curve defines exactly how much the decision maker is willing to give up in the achievement of one objective to obtain an improvement in another. Improvement in both objectives moves the decision to a different, more preferred, indifference curve. Thus

any point on a given curve is equally preferable (indifferent) to any other, and any point on a higher curve (curve 4 compared to curve 2, for example) is preferable to any point on a lower curve. These points are illustrated in figure 1. Points A' and A'' are equally preferable to the decision maker; Point A''' is preferred to both A' and A'' (Keeney, 1976:79).

Marginal Rate of Substitution. Assume we are given an indifference curve, two specified desirable attributes  $x_1$  and  $x_2$ , and point  $(x_1, x_2)$  on the curve (figure 2). At each point  $(x_1, x_2)$  we can ask, if  $x_2$  is increased by an incremental amount L, how much of  $x_1$  ( $dL$ ) must we give up to remain indifferent? The marginal rate of substitution is defined as L over  $dL$ . The simplest case of this rate is a global rate, where the marginal rate does not depend on the values of  $x_1$  and  $x_2$ , and the indifference curve is linear. Although linear indifference curves are not generally realistic, indifference curves in this thesis will be linear for the sake of graphical simplicity (Keeney, 1976: 82-85).

Acceptable Attribute Levels. Acceptable attribute levels are levels of a particular attribute beyond which the value is preferentially unacceptable. If an alternative exceeds the maximum or does not meet the minimum acceptable attribute level, it is no longer viable (MacCrimmon, 1969: 10). Minimum attribute levels are shown on Figure 3 for the attributes on both axes. Note that the area of consideration is smaller with these restrictions.

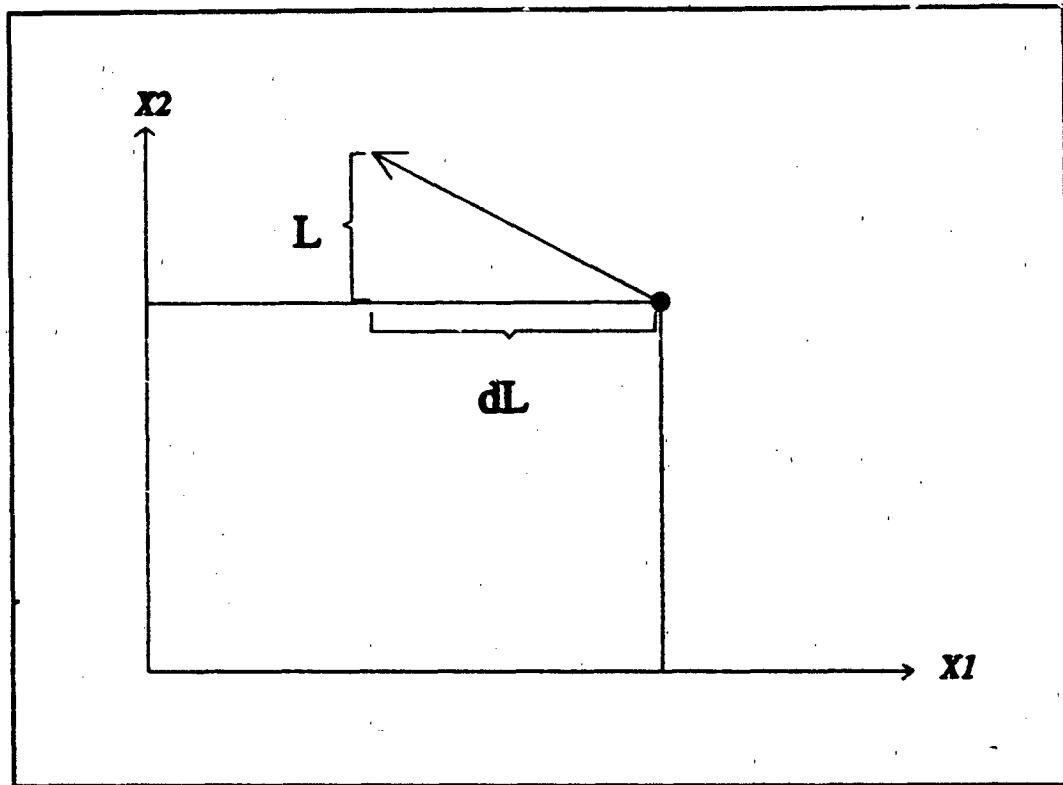


Figure 2. Marginal Rate of Substitution.  
Keeney, 1976: 83.

#### Application of the Hierarchy

Although construction of a utility function would be the logical next step after creating a hierarchy of objectives, a utility function is beyond that scope of this thesis. However, Chapter IV will apply the hierarchy using a simplified decision evaluation technique, proposed by Manheim and Hall, which allows the decision-maker to logically consider his preferences without resorting to the complex mathematics of a utility function (Manheim, 1968: 733).

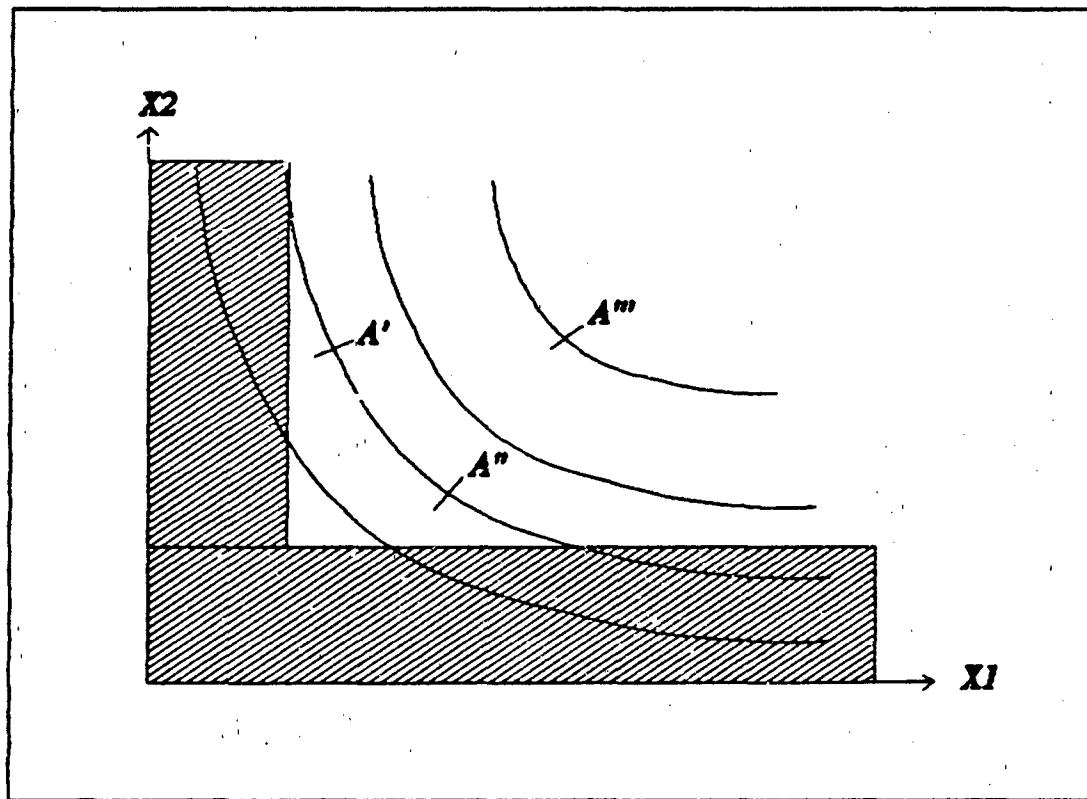


Figure 3. Minimum Acceptable Attribute Levels

This method, after establishing the "goal fabric" as introduced previously, uses this fabric to rank alternatives:

This [procedure] entails mapping each new alternative onto the goal fabric (i.e., predicting the performance of the alternative with respect to some of the goals) and then, using this mapped information and the structure of the goal fabric, comparing the new alternative with one previously ranked, to fit the new one into the ranking. (Manheim, 1968: 733)

As appropriate to our purpose of analyzing a simple decision, this method "operates on only two alternatives at a time" (Manheim 1968: 733). Manheim and Hall describe this procedure in more detail as follows:

The third step [after establishing the goal fabric] is to determine which goals can be predicted and measured with some accuracy and to obtain the predictions. These will not always be the lowest-level goals, but there must be a predictable goal in every branch of the tree -- if there is one at a high level none are necessary below it . . . . The last part of this step is to convert the predicted data into preference information on each goal. This entails deciding which alternative is preferred on that goal and, if possible, the degree to which it is preferred, measured in any of several possible ways . . . .

The fourth step uses this information to move up one level in the goal fabric, from the predictable goals to the next level of goals. There are roughly five techniques that can be used to condense the data. All the techniques operate to give information on one higher-level goal at a time, working with those goals which comprise the higher one . . . . (Manheim, 1968: 736-737)

This thesis will use the two simpler of these five techniques:

(1) Dominance: the same alternative is preferred on all the goals comprising the new one; hence that same alternative is preferred on the new goal . . . .

(2) Explicit choice by DM [decision-maker]: faced with a small subset of goals, the DM is usually able to evaluate trade-offs and choices mentally, and give an answer. (Manheim, 1968: 736-737)

Further explanation of this method appears in Chapter IV, where it is actually applied to a historical decision, but it is introduced here to reference the source.

With these decision analysis concepts understood, we are prepared to discuss the model developed in The Limits of Moral Principle: An Ends, Means, and Role Spheres Model of the Ethical Threshold by Captain Clark Bruce Kidd.

### The Ethical Threshold Model

The model will be introduced with a description in its own terms, then analyzed from the perspective of multiple-value decision-making principles.

Original Model. Kidd's model, to be referred to as the "ethical threshold" model, is a description of the tradeoffs necessary when intrinsic and extrinsic values conflict:

Moral dilemmas arise where behavior that would otherwise be considered bad (lying, killing, etc.) is justified by the moral ends it is intended to accomplish. Stated more simply, "the ends justify the means." (Kidd, 1986:7)

These moral dilemmas can be described as a conflict between intrinsic value and extrinsic (or instrumental) value:

[C]ases of moral goodness can be relatively classified as either intrinsically good (as an end), or as instrumentally good (as a means to an end). The classification is relative because any end that is considered intrinsically good in one light can also be considered as instrumentally good in attaining a higher moral principle. This implies the existence of an ends/means chain of moral relationships. (Kidd, 1986: 39)

Kidd's discussion of means and ends should not be confused with Manheim's "means-ends" relation. Manheim's "means" are specific representations of general values, while "means" in the ethical threshold are behaviors which may have a high value towards one end but a low value in terms of another, conflicting end.

The ethical threshold model (figure 4) places actions (of any sort, not only military) onto an "ethical value 'response surface'". The action of concern is plotted by

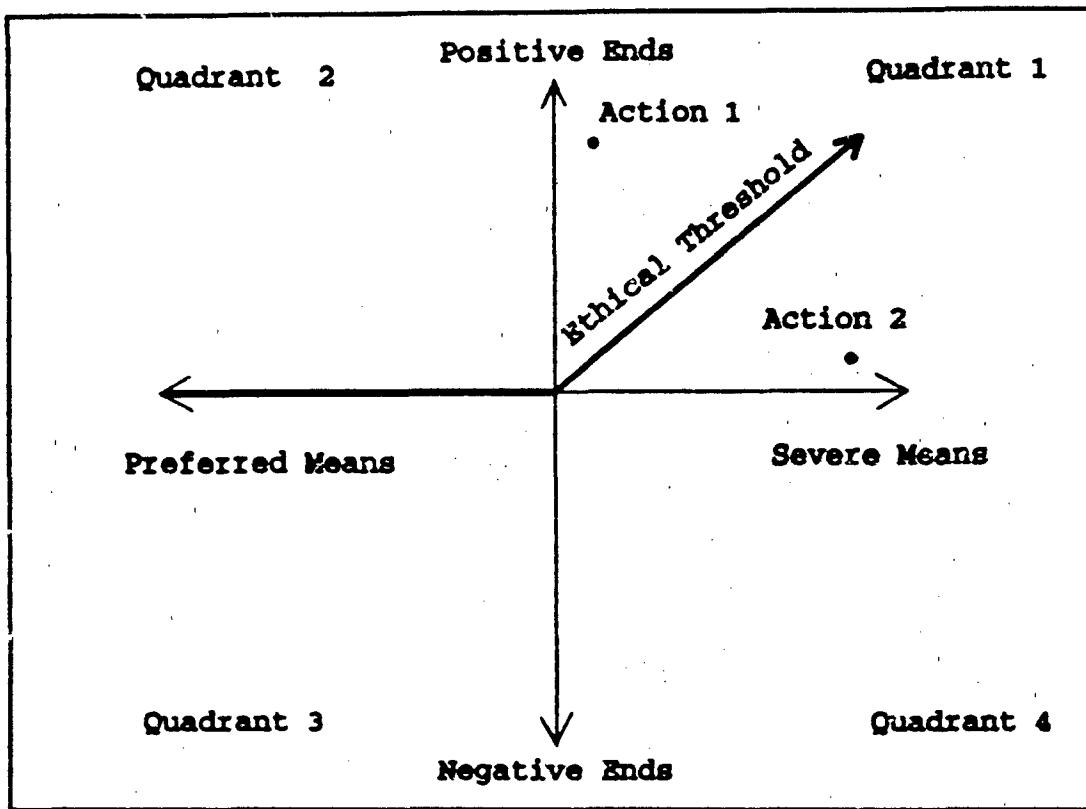


Figure 4. Ethical Threshold Model (Kidd, 1986: 53)

two coordinates, the "means" coordinate and the "ends" coordinate. This model assumes that every means can be placed somewhere along a range from "preferred means" to "severe means," and that every end can be positioned along the positive-negative range. The "ethical threshold" is "a separation boundary between where it is unethical to use too severe means to accomplish too petty an objective, and where it is acceptable to use severe means to accomplish a worthy end . . ." (Kidd, 1986: 45). An action in war can be plotted if its coordinates can be defined, and the action will fall either above or below this threshold line. An

action above the threshold line is considered ethical, and below the threshold line is considered unethical.

Figure 4 shows examples of both types of actions. Action 1, for example, could be the use of espionage to help defeat Germany in World War II, which would seem to be easily justifiable, considering the ends of ensuring the freedom of Western Europe. Action 2, on the other hand, would be the use of a nuclear weapon to take over the island of Grenada, in which the ends of securing the freedom of a small island nation would not seem to justify the severity of the weapon used.

Kidd also included a third parameter in his model to further explicate the ethical complexities of violent action. This is the "role sphere" parameter (added in Figure 5), which considers that "societies, in order to promote more orderly functioning and thereby better promote the general welfare of all, assign different levels of moral responsibility to different individuals" (Kidd, 1986:48). An individual must be within the bounds of responsibility assigned to him to be able to function ethically. For example, society expects a policeman to use violent means, if necessary, to do his job, but it does not condone the average citizen enforcing the law, as in vigilantism (Kidd, 1986:49).

Figure 5 illustrates the location of the role spheres parameter as it relates to the overall model. The heavy black line shows how the role spheres parameter further

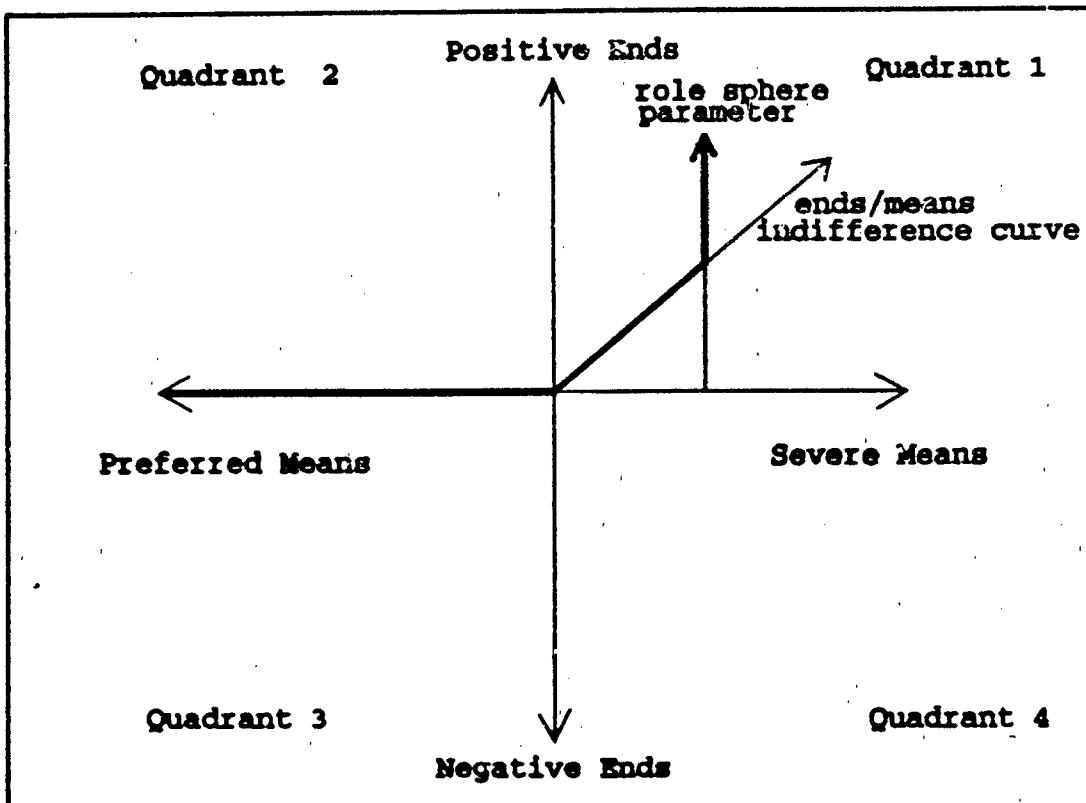


Figure 5. Completed Ethical Threshold Model.  
(Kidd, 1986: 53)

limits the ethical region of action; if a person is operating beyond his role sphere, he is in the unethical region.

The examples presented demonstrate that the first quadrant of the model is the most useful in difficult moral dilemmas:

The question [sic] of ethics in quadrants 2, 3, and 4 are fairly straight forward. In quadrant 2, good means pursuing good ends presents an ethical moral situation. In quadrants 3 and 4, pursuit of bad ends is always an unethical moral situation. The tough moral decisions are the ones that fall in quadrant 1. (Kidd, 1986:53-54)

Quadrant one is the focus of the reinterpretation of the model from a decision-making perspective.

Model Interpretation. Based on the previous review of decision analysis literature, the ethical threshold model can be seen as a general description of an indifference curve. In fact, it is described as an "ends-means indifference curve" (Kidd, 1986: 48) at several points in the text of the thesis. This resemblance is clarified in Figure 6 by comparing figure 1 and the first quadrant of the ethical threshold model. It can be seen that the model follows the general form of indifference curve between

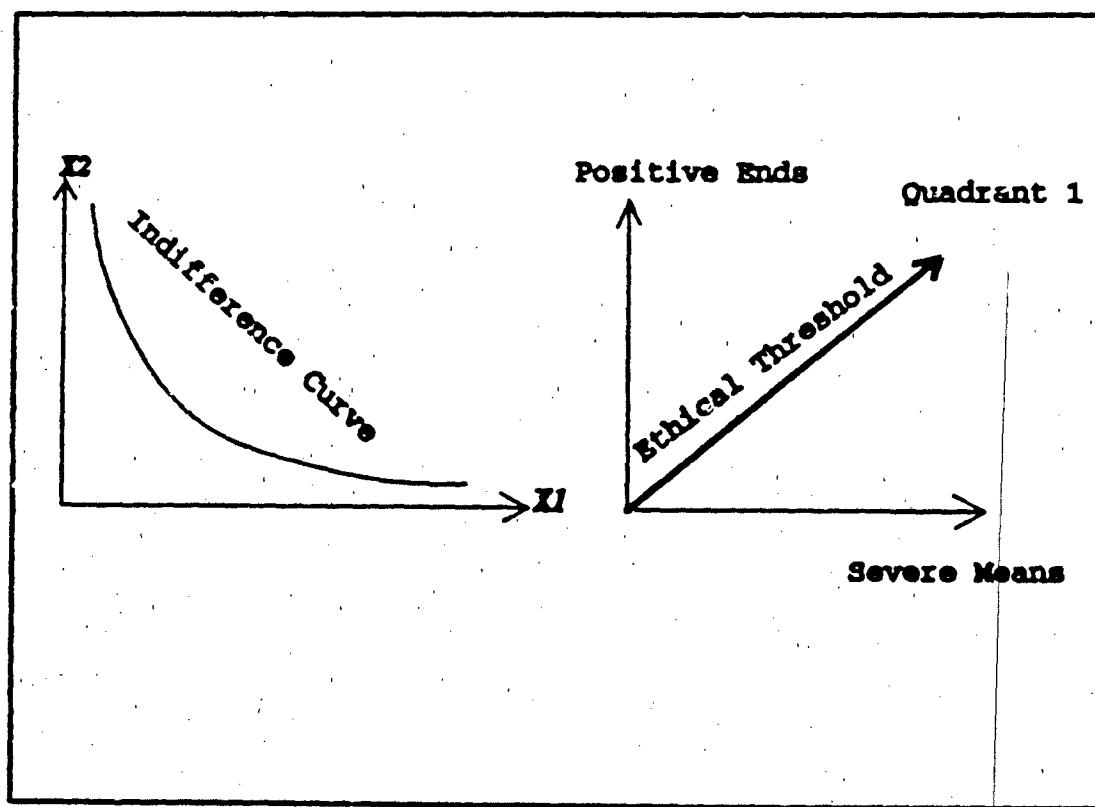


Figure 6. The Ethical Threshold as an Indifference Curve

attributes, except for the reversed orientation of the horizontal axis, and the inclusion of the role sphere parameter. The principal difference is the labeling of the axes; the ethical threshold places different ethical values (or attributes), ranked in importance, along each axis, while a conventional indifference curve places various levels of two specific attributes along each axis. The ethical threshold model is more complex than it appears; each value placed along the axis has a range of values itself. Thus each ethical value has an indifference curve with respect to the ends, and the ranking of values is really a description of varying indifference curves.

This realization can be demonstrated with two ethical values, placed along the horizontal axis, as examples: "protection of human life," and "telling the truth" (in espionage, for instance). A hypothetical indifference curve is shown for each value with respect to a potential end, placed on the vertical axis, which we will term "preservation of just social order" (Figures 7 and 8). These two hypothetical curves show a small increase in "preservation of just social order" can yield a large reduction in the value of "telling the truth," while a large increase in "preservation of just social order" is required to reduce the value of "protection of human life." Note that the marginal rate of substitution has been shown on each indifference curve, showing how much the decision maker is willing to trade off ( $dL$ ) for an increase in  $L$ .

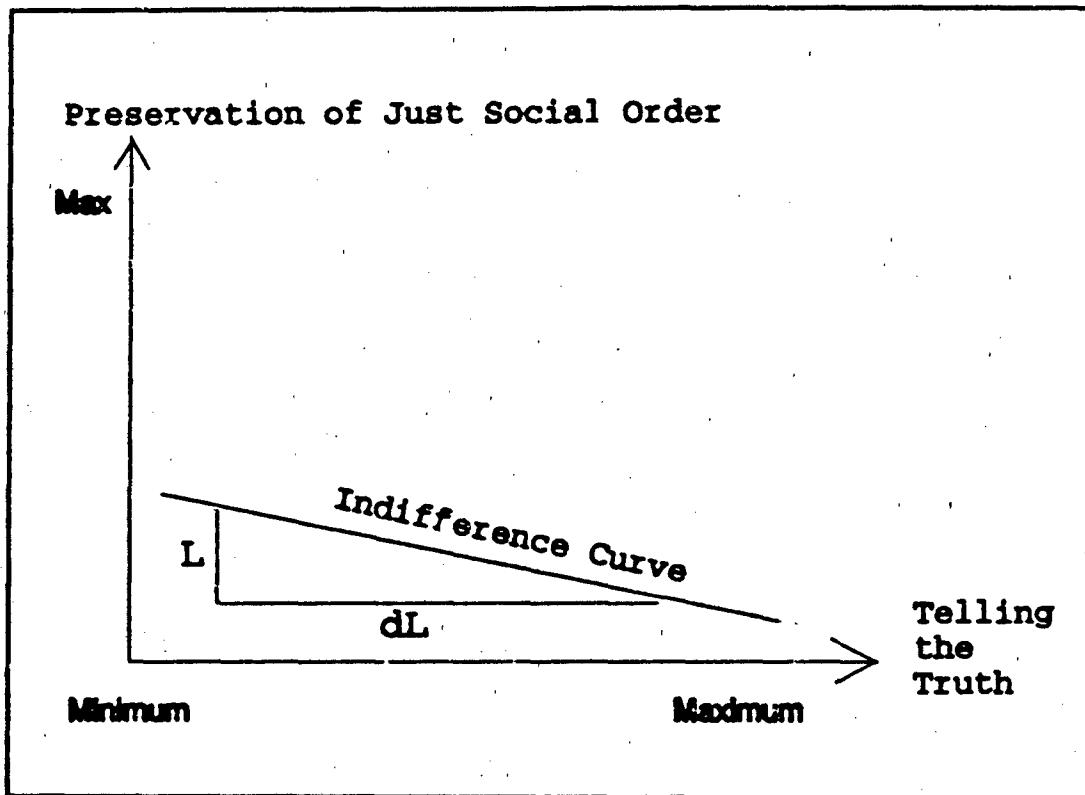


Figure 7. Indifference Curve for Telling the Truth.

Because "protection of human life" is a higher principle, it requires a greater increase in the "preservation of just social order" before it is "traded-off." The precise nature of these tradeoffs is beyond the scope of this thesis, but their existence is an integral part of the hierarchy of objectives.

To summarize, the ethical threshold model graphically captures the following concept: ethical action often involves a tradeoff of values, and the willingness of the decision-maker to trade off depends on the relative importance of the principles involved. With this concept

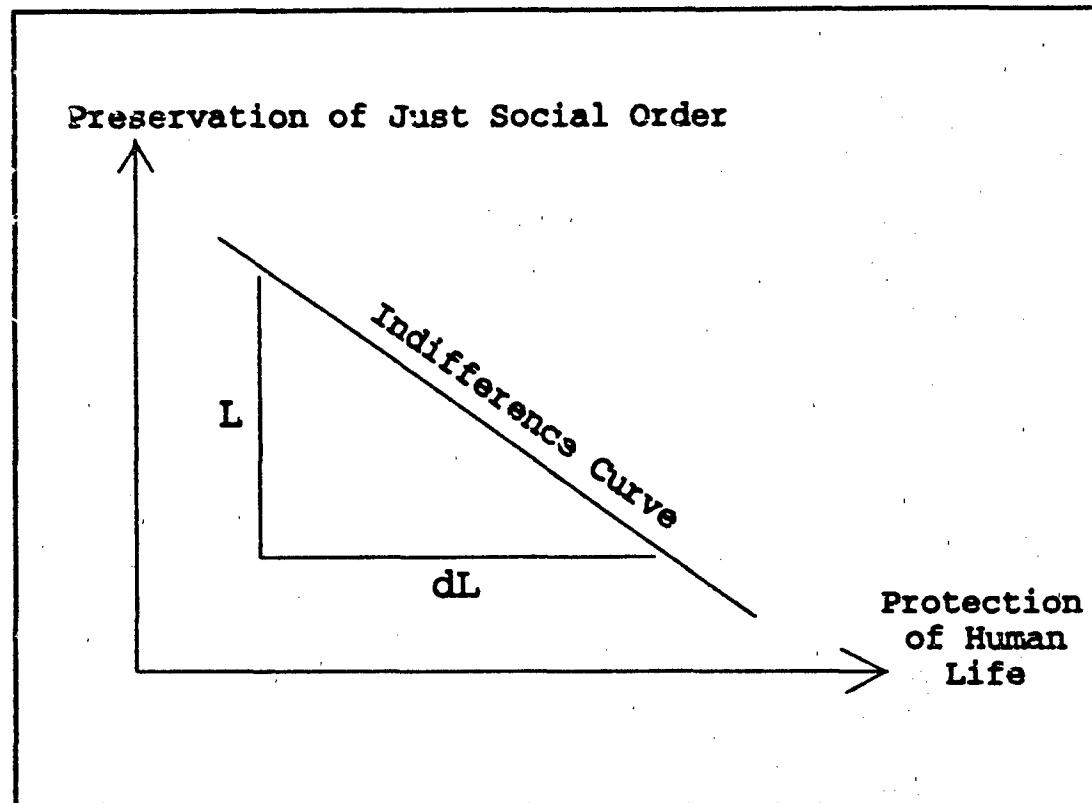


Figure 8. Indifference Curve for Protection of Human Life

understood, the identification of the values involved in a military decision can continue.

#### Ethical Values

The values involved in a military decision will be divided into two areas: the moral values of man, and the professional ethics of the soldier in his role in the military. Stated another way, there are two aspects of any decision: an ethical evaluation of the action itself, apart from the decision-maker; and an ethical evaluation of the action considering the roles and obligations of the decision-maker. The first aspect is generally called just.

war theory, and the complementary aspect is known as professional ethics.

#### Just War Theory

Just war theory, or bellum justum, is a classical theory to "distinguish justifiable wars from unjustifiable wars, using a set of consistent and consistently applied rules" (Lackey, 1989: 28). The current formal nature of just war theory is generally traced to the early medieval Christian philosopher Augustine, who developed his ideas while Bishop of Hippo from 396-430. Prior to this period, the Christian church had gained considerable political power during the reign of the Emperor Constantine (306-337). As the influence of the church continued, Augustine attempted to resolve early Christian pacifism with the realities of church involvement in political entities (Phillips, 1984: 5-9). His ideas were further refined by other Christian philosophers such as Thomas Aquinas (1225-1274), and the ideas of just war have continued even though the church's direct political power faded with the rise of European nationalism (Phillips, 1984: 9)

This area of study is generally divided into two elements: "rules that determine when it is permissible or obligatory to commence violent hostilities (jus ad bellum), and "rules that determine how a war should be fought once it has begun (jus in bello)" (Lackey, 1989: 29). Although it would seem that beginning a war is principally a political

decision, there are cases where jus ad bellum may be important for the military decision-maker as well:

Jus ad bellum rules apply principally to political leaders; jus in bello rules apply principally to soldiers and their officers. The distinction is not ironclad, since there may be situations in which there is no morally permissible way to wage war, in which case it follows that the war should not be waged in the first place. (Lackey, 1989: 29)

Thus jus ad bellum has been included as part of the values to be considered in military decisions.

The translation of bellum justum as "just war" is somewhat misleading, according to Robert Phillips. "Justified war" would be a better term, because certainly war by itself cannot be considered intrinsically just:

On the traditional view, war is always an evil insofar as it involves a physical attack upon another person. There may, however, be situations where fighting is the lesser of evils, but in such cases the use of force must be justified. *Prima facie*, attacking another person is evil and, indeed, can never be anything else qua attack. But we may upon occasion find that it is the only means of avoiding an even greater evil.

(Phillips, 1984: 14)

For this reason, this text will use the term "justified war" when referring to "just war" principles.

Bellum justum is not a collection of moral principles, but rather a concise way of applying moral principles to the decision to use force:

... . bellum justum also constitutes an effort to make statecraft compatible with the moral principle forbidding murder, as well as sundry other prohibitions against doing violence to others . . . bellum justum is essentially a moral tool or device whose purpose is to allow us to sort out or anatomize a situation to which two

prima facie conflicting sets of principles are said to apply, namely, principles of statecraft and morality. (Phillips, 1984: 15)

Hence bellum justum principles may not translate directly into our hierarchy of objectives (though they may be attributes), but they indicate the values which are considered important in justified warfare. The individual components of jus ad bellum and jus in bello will be explained in the following sections.

Jus ad bellum. To be justified in entering into a war, the following criteria are generally required to be satisfied to some degree:

1. Last resort: war should be initiated "only after it is clear that other means are not adequate to resolve the issue." (Phillips, 1984: 14)
2. Declared by legitimate authority: war must involve "the controlled use of force for political purposes" This limits the use of war as a means of personal vengeance. (Lackey, 1989: 30)
3. Just cause: the definitions of a just reason to go to war are various and debatable, but usually include reasons such as self-defense and correction of an injustice which a legitimate authority has failed to correct (Phillips, 1984: 18-20)
4. Right intention: the just cause must not be a pretext for some other reason (Wakin, 1986: 220).

A justified war should be "a war for the right, fought for the sake of the right" (Lackey, 1989: 31).

5. Reasonable chance of success: "it would be irrational to engage in war if there were absolutely no possibility of winning" (Wakin, 1986: 220).

6. Proportionality: a war cannot do more harm than good; "a war cannot be just unless the evil that can reasonably be expected to ensue from the war is less than the evil than can reasonably be expected to ensue if the war is not fought (Lackey, 1989: 40).

These six principles, with some variations, are generally considered to be a "moral checklist" for the evaluation of commencement of hostilities.

Jus in bello. Once in engaged in hostilities, the principles of jus in bello define the moral character of actions on the battlefield. A brief summary of these two principles follows:

Proportionality. Although this rule is similar to that used jus ad bellum, the formulation is more specific to the task at hand:

... the amount of destruction permitted in pursuit of a military objective must be proportionate to the importance of the objective. . . It follows from the military principle of proportionality that certain objectives should be ruled out of consideration on the grounds that too

much destruction would be caused in obtaining them. (Lackey, 1989: 59)

Each destructive action in war, then, must be "justified" by the importance of the objective. The parallel to jus ad bellum is clear: both the amount of destruction in the entire war, and each individual action in the war, must be "justified" by the respective goals.

Discrimination. This is also known as the principle of noncombatant immunity: "civilian life and property should not be subjected to military force: military force must be directed only at military objectives." (Lackey, 1989: 59). Lackey describes two possible versions of the principle of discrimination:

The objective version holds that if civilians are killed as a result of military operations, the principle is violated. The subjective version holds that if civilians are intentionally killed as a result of military operations, the principle is violated. (Lackey, 1989: 60)

The objective version is more restrictive, but even the subjective version is subject to the limitations of proportionality. In other words, if there are civilians unintentionally (not as a target) killed by an act of war, the amount should be proportionate to the objective attained. (Lackey, 1989: 60).

Paul Ramsey explains the relationship between the two concepts of proportionality and discrimination:

... the ends justify the means, since nothing else can; but they do not justify any means. The means which no ends can justify have to be determined by the principle of discrimination. The statement that only the ends justify the means

is a statement falling under the principle of proportion; so understood, it is unquestionably correct. The statement that the ends do not justify the means (or are not capable of justifying any and all means) is a statement falling under the principle of discrimination; so understood, it too is unquestionably correct. (Ramsey, 1983: 430)

This concludes the discussion of the moral value of an act of war. An explanation of professional military ethics follows.

#### Professional Military Ethics

In his landmark work The Soldier and the State Samuel P. Huntington uses the concept of the "military mind" to encompass the range of military values:

The military mind . . . consists of the values, attitudes, and perspectives which inhere in the performance of the professional military function and which are deducible from the nature of that function. The military function is performed by a public, bureaucratized profession expert in the management of violence and responsible for the military security of the state. A value or attitude is part of the professional military ethic if it is implied by or derived from the peculiar expertise, responsibility, and organization of the military profession. (Huntington, 1957: 61)

Huntington begins his description of professional values with a general overview of the military's purpose:

The responsibility of the military profession is to enhance the military security of the state. The discharge of this responsibility requires cooperation, organization, and discipline. Both because it is his duty to serve society as a whole and because of the nature of the means which he employs to carry out this duty, the military man emphasizes the subordination of the will of the individual to the will of the group. Tradition, esprit, unity, community--these rate high in the military value system. (Huntington, 1957: 63)

The assumption here is that the security of the state is important. Although this is apparently self-evident, this quotation from Thomas Hobbes describing the world without organized government provides some justification for the continuation of the state:

In such condition [without government], there is no place for industry; because the fruit thereof is uncertain: and consequently no culture of the earth; no navigation, nor use of the commodities that may be imported by sea; no commodious building; no instruments of moving, and removing, such things as require much force; no knowledge of the face of the earth, no account of time; no arts; no letters; no society; and which is worst of all, continual fear, and danger of violent death; and the life of man, solitary, poor, nasty, brutish, and short. (Yezzi, 1986: 105)

This thesis does not intend to prove the necessity of the state, but this statement is included to emphasize an important assumption: the continuation of the state is a preferred condition.

Returning to Huntington, he continues in the vein of a disciplined force serving the state, and derives the value of obedience:

To render the highest possible service the entire profession and the military force which it leads must be constituted as an effective instrument of state policy. Since political direction comes only from the top, this means that the profession has to be organized into a hierarchy of obedience. For the profession to perform its function, each level within it must be able to command the instantaneous and loyal obedience of subordinate levels. Without these relationships military professionalism is impossible. Consequently, loyalty and obedience are the highest military virtues . . . When the military man receives a legal order from an authorized superior, he does not argue, he does not hesitate, he does not

substitute his own view; he obeys instantly.(Huntington, 1957: 73)

Although obedience is the "supreme military value," Huntington does allow that there are other values which define the "limits of obedience." The two areas identified are professional competence and nonmilitary values (Huntington, 1957: 74).

Professional Competence. The instances where the value of professional competence may outweigh the value of obedience can be summarized into two types: operational and doctrinal conflict.

Operational Conflict. Operational conflict concerns "the execution by a subordinate of a military order which in his judgement will result in military disaster." Considering that "The purpose of obedience is to further the objective of the superior," disobedience in this case may be justified, but usually is not: ". . . the disruption of the military organizations caused by disobedience to operational orders will outweigh the benefits gained by such obedience" (Huntington, 1957: 75).

Doctrinal Conflict. Doctrinal conflict is a situation where superiors stifle new ideas in "tactics and technology," and disobedience by a junior officer may "advance professional knowledge." Again, the price of disobedience must be considered: ". . . the subordinate must consider whether the introduction of the new technique, assuming he is successful in his struggle, will so increase

military efficiency as to offset the impairment of that efficiency caused by the disruption of the chain of command" (Huntington, 1957: 15-75).

Nonmilitary Values. Nonmilitary values may conflict with the value of obedience in four areas: political wisdom, political threat to military competence, legality, and basic morality.

Political Wisdom. A military leader may consider disobedience to a political order when he feels that a particular policy is politically unwise. However, according to Huntington, disobedience in this case is out of place; the military officer must not forget that "it is not the function of military officers to decide questions of war and peace" (Huntington, 1957: 76-77).

Political Threat to Military Competence. When a political leader attempts to make decisions about purely military issues, he is committing a "clear invasion of the professional realm by extraneous considerations."

Disobedience in this case may be justified: "The statesman has no business deciding . . . whether battalions in combat should advance or retreat" (Huntington, 1957: 77).

Legality. The third area considers situations where a political leader gives an order that he does not have legal authority to issue. In the case where "the statesman in ordering his action recognizes himself that he is acting illegally, then the military officer is justified in disobeying." If the political leader thinks he is acting

legally and the officer thinks he is not, then the issue is "the relative competence of the officer and the statesman to judge what is legal and illegal." Thus the justification of disobedience in this case may not be so clear (Huntington, 1957: 78).

Basic Morality. The fourth case is the most difficult to resolve. Huntington summarizes it eloquently, when he describes the situation where obedience to an order may violate the officer's personal moral principles:

For the officer this comes down to a choice between his own conscience on the one hand, and the good of the state, plus the professional virtue of obedience, upon the other. As a soldier, he owes obedience; as a man, he owes disobedience.

His conscience will rule in only a few instances, because "rarely will the military man be justified in following the dictates of private conscience against the dual demand of military obedience and state welfare" (Huntington, 1957: 78).

#### Value Conflicts Explained

In reviewing Huntington's ideas, Malham Wakin describes more fully the nature of these types of conflicts:

Obedience to orders is not in itself either a legal or a moral claim of right action although it is certainly a mitigating circumstance. Military leaders cannot be merely instrumental to the state. They are instrumental, yes; but they must at the same time accept a portion of the responsibility for the uses of the military instrument. (Wakin, 1986: 188)

Wakin also adds to Huntington's view of professional competence as a potentially conflicting value:

With respect to the development of tactics, weaponry, long-range strategy, and the conditions for employing those weapons systems which pose serious threats to noncombatants, the military leader's competence is a crucial issue. Literally, he has a moral obligation to be competent in these areas. (Wakin, 1986: 211)

Michael Walzer, in his discussion of the relation of obedience to moral values for the soldier in Just and Unjust Wars, gives the moral independence of the soldier in a value conflict more weight than Huntington does:

Soldiers are conscripted and forced to fight, but conscription by itself does not force them to kill innocent people. Soldiers are attacked and forced to fight, but neither aggression nor enemy onslaught forces them to kill innocent people. Conscription and attack bring them up against serious risk and hard choices. But constricted and frightening as their situation is, we still say that they choose freely and are responsible for what they do. Only a man with a gun at his head is not responsible. (Walzer, 1977: 314)

Walzer suggests also that obedience is not an on-off characteristic, but a continuum:

. . . there are ways of responding to an order short of obeying it: postponement, evasion, deliberate misunderstanding, loose construction, overly literal construction, and so on. One can ignore an immoral command or answer it with questions or protests; and sometimes even an overt refusal only invites reprimand, demotion, or detention; there is no risk of death. Whenever these possibilities are open, moral men will seize upon them. (Walzer, 1977: 314)

Walzer does recognize that we cannot expect the soldier in the ranks to be capable of making the same moral judgements as their leaders:

From his narrow and confined vantage point, even direct violations of human rights--as in the conduct of a siege, for example, or in the strategy of an anti-guerilla campaign--may be unseen and unseeable. Nor is he bound to seek out information; the moral life of a combat soldier is not a research assignment. (Walzer, 1977: 313)

Walzer continues this idea by suggesting that officers carry a heavy burden of moral responsibility because of their rank and position. An officer must "fight with restraint, accepting risks, mindful of the rights of the innocent" (Walzer, 1977: 317). An officer is morally responsible for ensuring the principle of discrimination is observed in his campaigns, and also is responsible for the training and discipline of the men in his command in this principle (Walzer, 1977: 317).

Telford Taylor also describes the effects of rank on moral responsibility in his description of the possible defenses for a soldier accused of a war crime. He cites two main factors which must be considered in assigning responsibility: knowledge and fear. His discussion of knowledge echoes Walzer's:

. . . especially in combat situations, there are bound to be many orders the legitimacy of which depends on the prevailing circumstances, the existence and sufficiency of which will be beyond the reach of the subordinate's observation or judgement . . . . Especially in the lower ranks, virtually unquestioning obedience to orders, other than those that are palpably vicious, is a necessary feature of military life. (Taylor, 1970: 49-50)

Walzer and Taylor also agree on the "man with a gun at his head," obeying out of fear:

It is one thing to require men at war to risk their lives against the enemy, but quite another to expect them to face severe or even capital penalties on the basis of their own determination that their superior's command is unlawful.  
(Taylor, 1970: 50)

Thus the choice between obedience to conscience or to superiors may be complicated by other factors.

#### Chapter Summary.

This chapter accomplished three purposes. The first sections outlined the general procedure for multivalue decision analysis and detailed the parts of this science crucial to the thesis. The middle sections analyzed the ethical threshold model from the decision analysis perspective, clarifying its meaning for the reader. The final sections introduced the moral and professional values which are parameters in military decisions. With these parameters defined, development of an orderly hierarchy can continue.

### III. Model Development

#### Introduction

The hierarchy of objectives which describes the values important in a military decision will be constructed progressively, adding parameters and justifying their inclusion in a stepwise fashion. This chapter will begin with a description of the assumptions of the hierarchy and then proceed with a section devoted to each high-level objective. The final section will discuss the effect of roles on the interpretation of the hierarchy.

#### Assumptions of the Model

1. Military members are moral agents; that is, membership and action in the military does not relieve a man of his moral obligations as a human being.
2. Military decision-makers are rational actors who seek to act so their moral objectives are achieved to the maximum extent possible.
3. Military decisions involve complex value judgements requiring tradeoffs between conflicting values.
4. Membership in the military complicates the moral obligations of the member because professional values of the military must be considered as well as personal moral values.
5. Moral evaluation of an action is a function not only of the circumstances of the action

itself, but of the knowledge and intention of the actor.

6. The value of an action with respect to a particular objective can be positioned on a continuum; that is, there are various levels of right intention, legitimate authority, obedience, and so forth.

7. Values themselves can be placed along a continuum of value, so that the most significant is at the top and the least significant is at the bottom.

These assumptions enable the following derivation of a hierarchy of values.

#### Dichotomy of Values

The hierarchy begins with a general top-level objective of living morally, which will be termed "The Good Life" (Manheim, 1968: 734) for want of a better phrase. "The Good Life" follows from the second assumption above, and implies the general objective to maximize the ethical value of decisions. For a general discussion of the relationship between "The Good Life" and ethical action see Aristotle's Ethics (c. 340 B.C.). The initial specification of objectives is derived from the basic dichotomy of values in the literature review: moral values and professional values (Figure 9). As Huntington says, the military professional is both a servant to the state and to his conscience (Huntington, 1986: 52). Moral values will be labeled

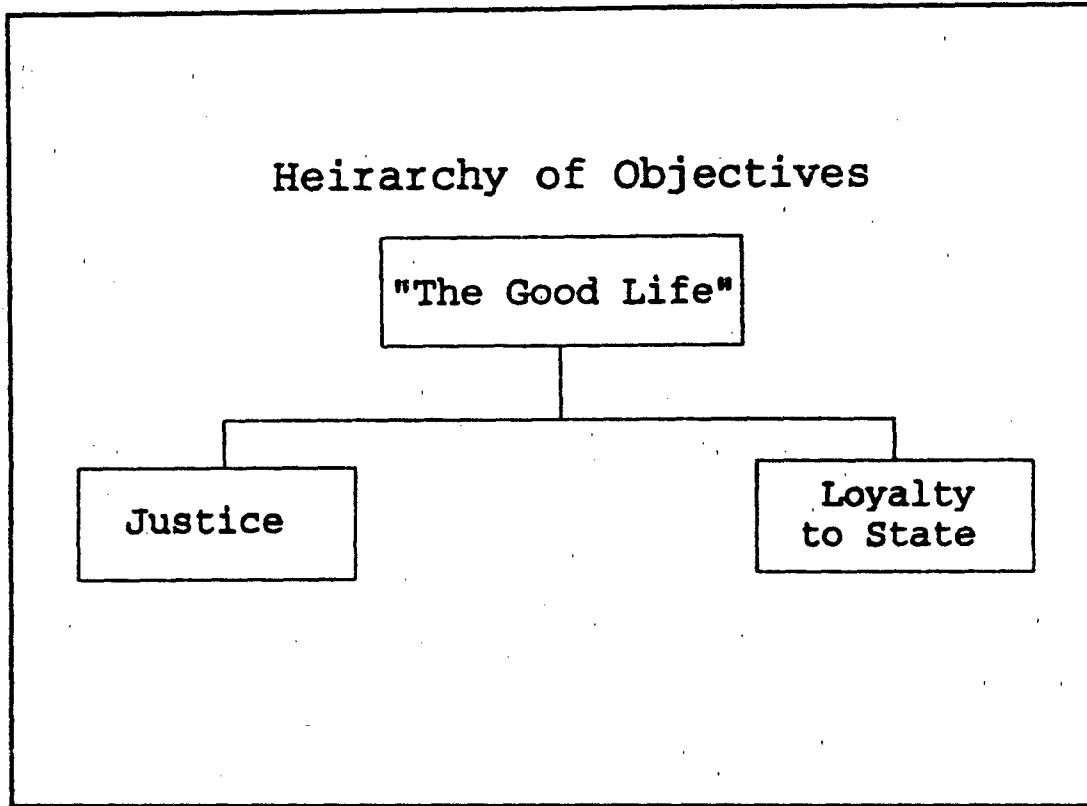


Figure 9. Dichotomy of Values

"justice" and professional values labeled "loyalty to the state."

Loyalty to the State

The title for this objective indicates the source of professional values: the purpose of the profession is the defense of, and thus loyalty to, the state. Loyalty to the state as the decision-maker's sole value is a simplified version of the "military mind." A man with only this objective sees himself as "merely instrumental," and his only obligations relate to the state. The loyalty value can then be specified by three lower-level objectives referenced.

by Huntington and Wakin, obedience to the law, obedience to superiors, and professional competence (Figure 10).

These three values can be best understood in terms of expectations: the military man is expected to obey the laws of the state, obey the orders of his military leaders who

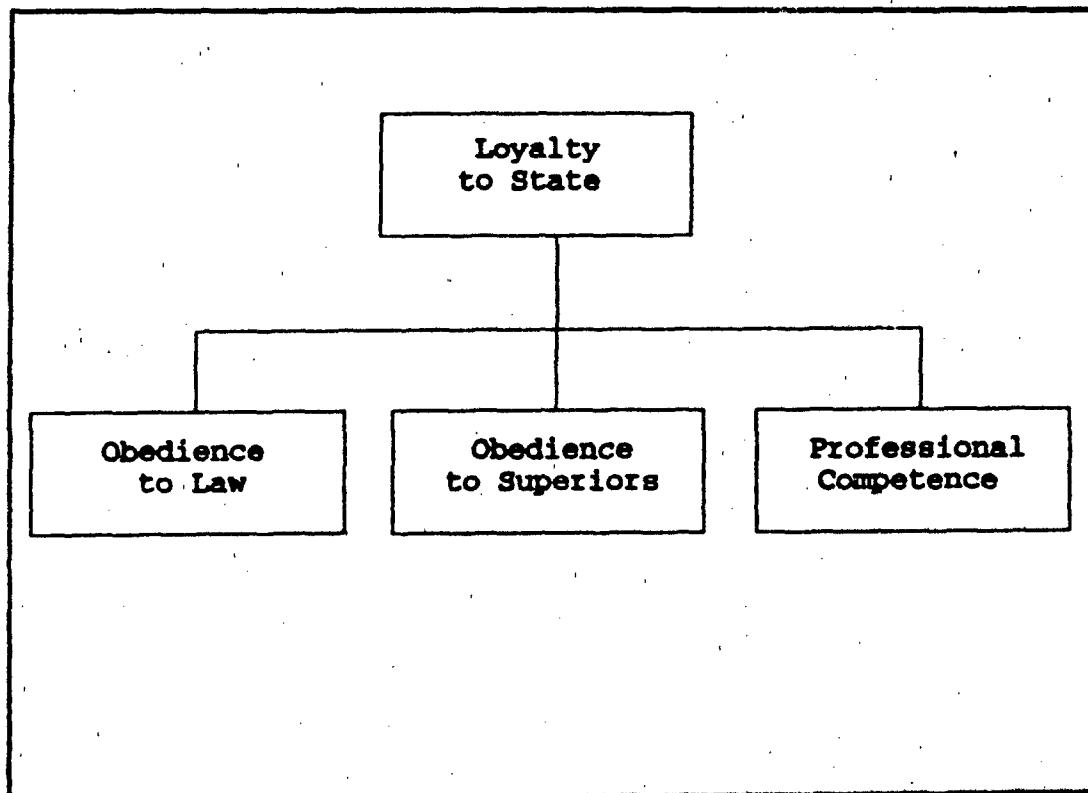


Figure 10. Specification of Loyalty

represent the state, and satisfy the requirements of professional competence.

Inclusion of professional competence as a specification of loyalty to the state makes sense considering the purpose of the military: to support the purposes of the state. A

competent decision is one which accomplishes the objectives of the state, which is the essence of loyalty. The objectives of the state are the objectives of the military man because he is loyal.

Value Conflicts. Even this simple military man may experience value conflicts. The military professional values obedience, but only to the extent that obedience reflects professional competence. Huntington advises us that a low value in the area of competence may justify a low value in obedience (recall Walzer's continuum of obedience). Thus the attributes of obedience and competence are value-wise dependent.

This is an important lesson of the hierarchy, that obedience is but one aspect of loyalty to the state. If a commander tells a subordinate to perform a military action which does not advance the objectives of the state, the subordinate may be justified in disobeying that order (totally or to some degree) on the grounds that his higher loyalty is to the state, not to the commander. In fact, both the commander and the subordinate share the same objectives because, as stated before, the objectives of the state are the objectives of military men through loyalty. The conclusion of this reasoning is startling; disobedience to a military order, normally considered a dishonorable thing, may be the decision most loyal to the state. Of course, the degree of disobedience must be appropriate to the severity of the incompetence. Hence a slightly

questionable order should be met with mild verbal suggestions to change, while an order certain to lead to abject failure would require absolute disobedience.

Legal obedience is value-wise dependent with military obedience in a similar fashion. The military professional values obedience to his superiors, but only when a lawful order is given. Again, the severity of disobedience should be relative to the flagrancy of the crime.

Competence Specified. Continuing down the "professional competence" branch of the hierarchy, Huntington's definition of professional competence provides us with two specifiable attributes: operational competence

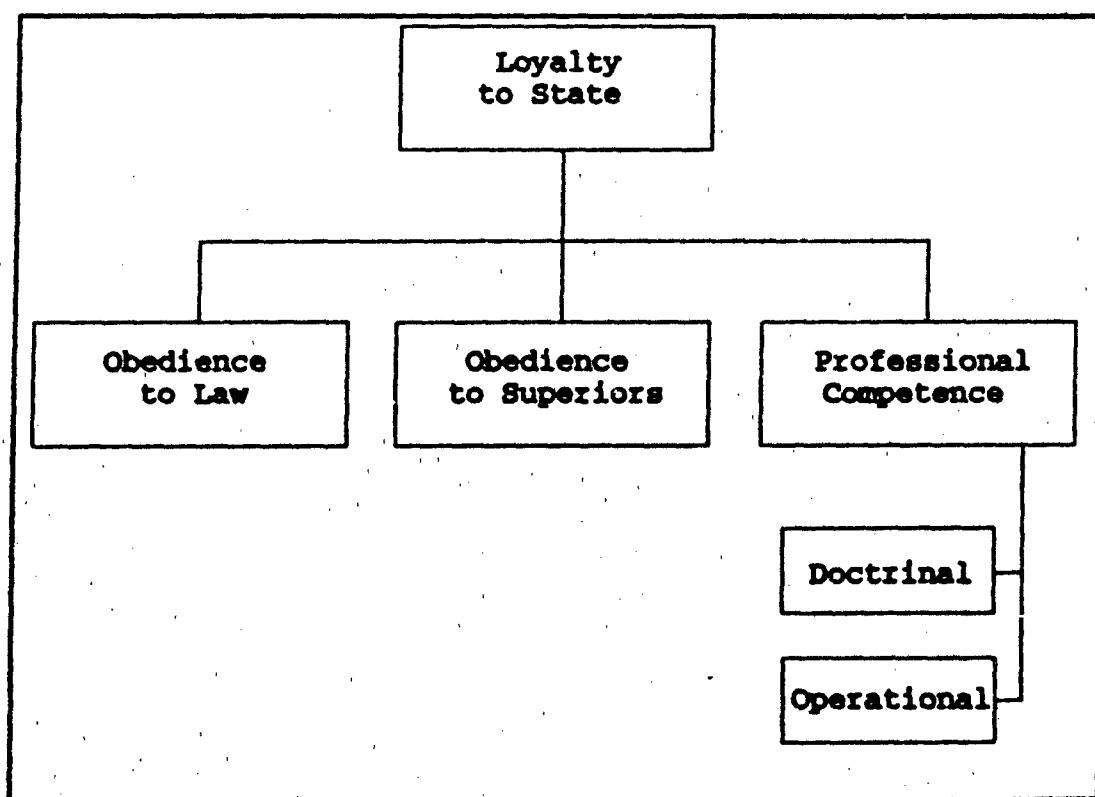


Figure 11. Competence Specified

and doctrinal competence (Figure 11). Recalling these definitions, a decision which would lead to military failure or which reflects an adherence to outdated doctrine would be professionally incompetent, presumably to a greater or lesser extent. The less competent an action in either respect, the more justified a reduced level of obedience.

To summarize this branch of the hierarchy, a military person is expected to consider the laws of the state, the orders of his superiors, and the requirements of military competence; evaluate the tradeoffs between these values; and make a decision leading to action.

#### Justice

Considerations of justice will complicate the decisions of our simple military man. But this is essential, if he is to act morally. He must listen to his conscience, or he has denied his humanity and become "merely an instrument." To simplify the explanation, the moral values will be described alone and then added to the overall hierarchy. Justice is specified by two overall values: preservation of just social order and preservation of human life (Figure 12).

Preservation of Just Social Order. "Preservation of just social order" is a reference to justum bellum in the sense that a justified war is one which contributes to an improved social state, or at least maintenance of an existing desirable state. From this point in the thesis, "preservation of society" and "preservation of just social

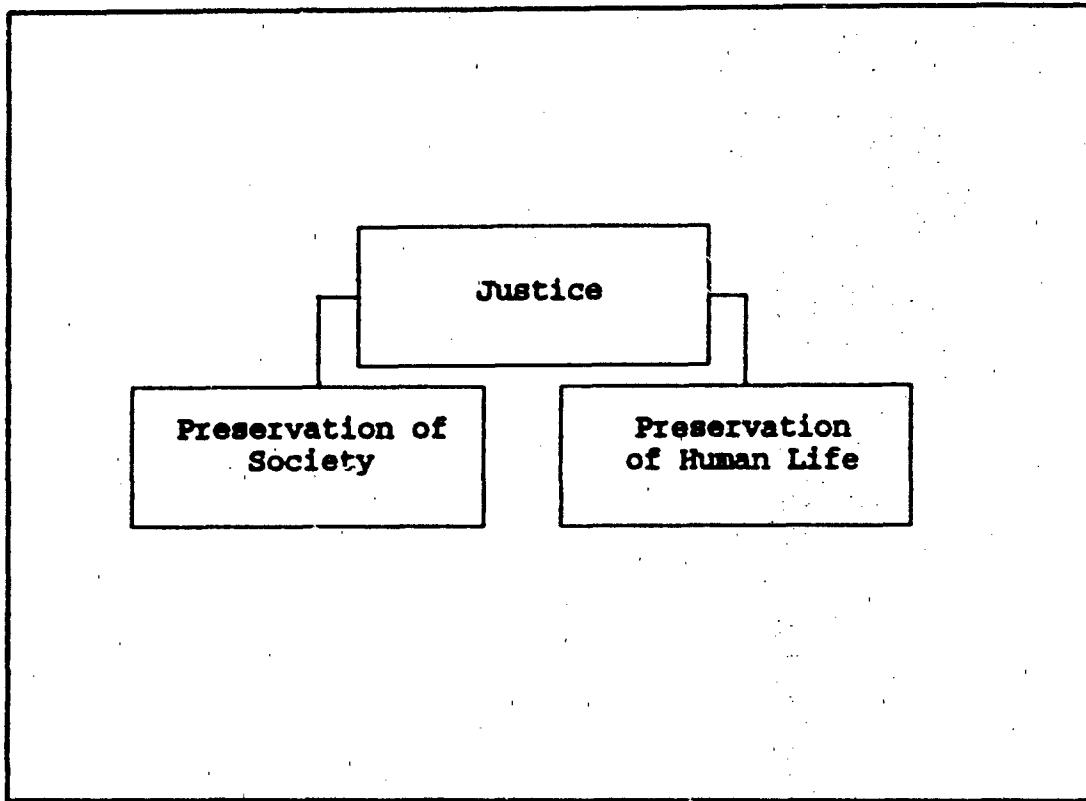


Figure 12. Specification of Justice

"order" will be used interchangeably in the text for convenience. The value of an action with respect to the preservation of just social order is related to the threat to society the action counteracts; if the threat is great, a successful response to the threat has high value to the preservation of just social order.

The principles of jus ad bellum are attributes of the objective of preservation of just social order. All except proportionality are included under this portion of the hierarchy: last resort, legitimate authority, just cause, right intention, and success probability (Figure 13). The concept of proportionality is itself a relation between two

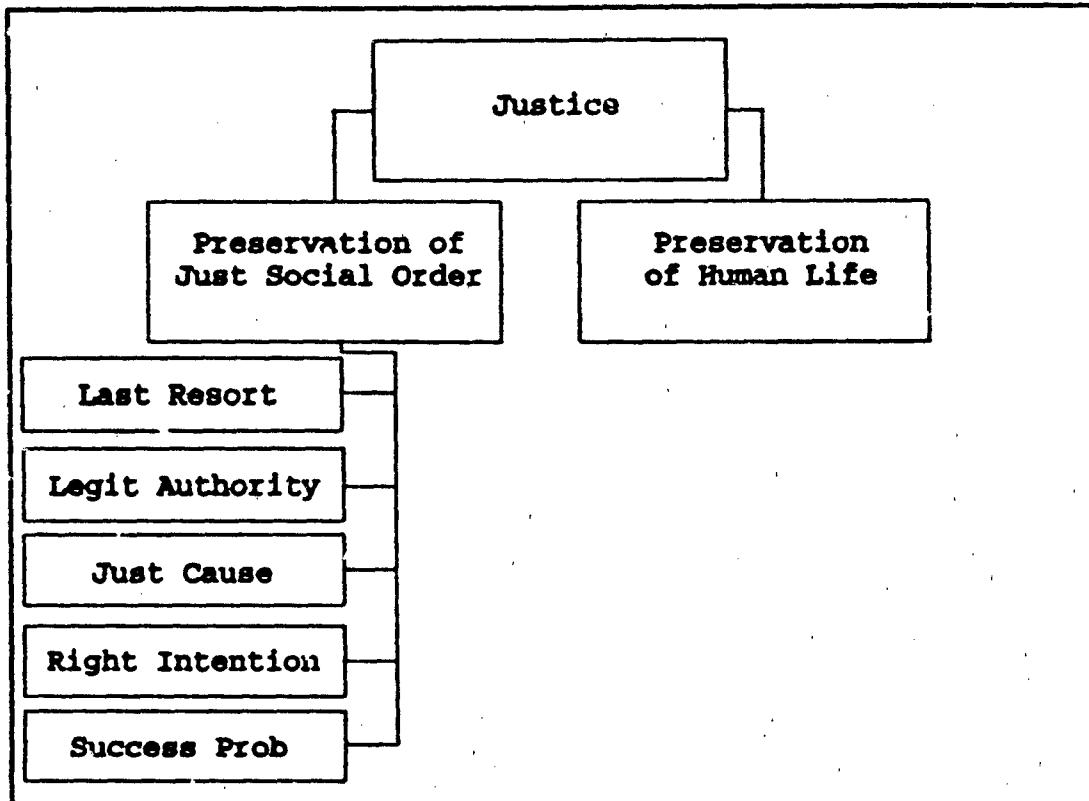


Figure 13. Preservation of Just Social Order Specified

attributes, to be explained later, so it has not been included as an attribute of preservation of society.

Preservation of Human Life. Potential candidates for specification under justice include traditional values such as telling the truth, freedom of action, rights to personal property, and so forth. These should all be included in the hierarchy of objectives. However, to simplify the model and show clearly the relations between these values and others included in the model, only one value has been named: preservation of human life. Human life is the value most critically at stake in the "management of violence," hence it is an appropriate example to include in the model. In

terms of the ethical threshold model, preservation of human life is a value which would appear far to the right on the horizontal axis of the model, which is called a continuum of values in the assumptions above. As mentioned before, a continuum exists for the degree of attainment of this value as well, which the ethical threshold model does not fully recognize. Thus an act could preserve a greater or lesser number of human lives. The maximum value of "preservation of human life" is to perform an action which kills no one, and the minimum value (theoretically) is to kill everyone.

Additional explanation for the selection of preservation of life as an exemplary "higher" value can be provided in terms of the ethical threshold's "ends/means chain." At the "low" end of the chain, for example, the sacrifice (tradeoff) of the value of telling the truth (lying) to support the end of preservation of personal property would appear, assuming preservation of personal property is a higher value than telling the truth. Placed at or near the "high" end of this chain is the value of the preservation of human life sacrificed for the end of preservation of just social order. Since this part of the "chain" is most crucial in warfare, these two values have been chosen for the justice portion of the hierarchy, but the reader must recognize that the picture of values is much more complex.

The overall objective of preservation of human life also requires further specification to identify whose lives

are under consideration. The different "types" of lives are "friendly" combatants, enemy combatants, "friendly" noncombatants, and enemy noncombatants (Figure 14). The definition of enemy and "friendly" combatants should be obvious. Noncombatants were referenced in the literature

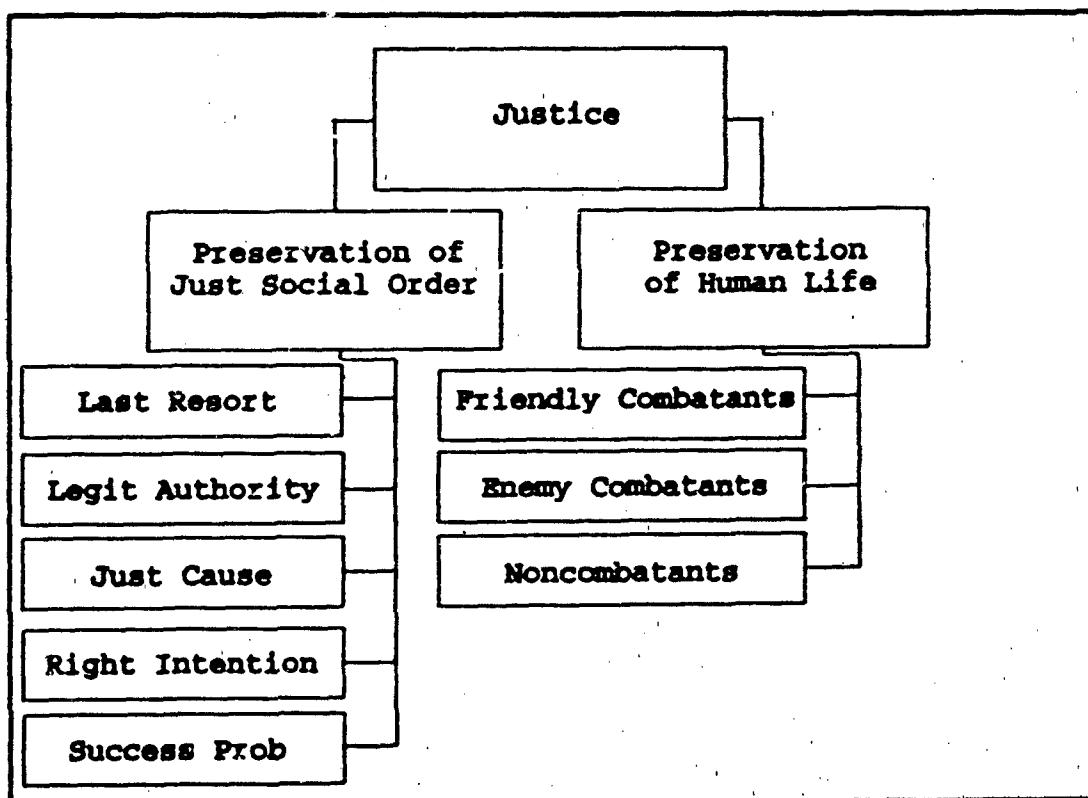


Figure 14. Types of Human Life

review without definition because of the difficulty of exhaustively defining noncombatants in modern warfare. It is sufficient to say that while all human lives are valued in warfare, the human lives involved can be categorized into these four types.

Explanation of Proportionality. With the inclusion of preservation of human life as another value, the concept of proportionality logically follows. The value of preservation of human life (in general) can be seen to be value-wise dependent with preservation of society. If a war is fought in response to a grave threat to society, a greater sacrifice of the preservation of life is acceptable than if a war only counteracts a mild threat.

Proportionality (Figure 15) is a description of that value-wise dependency. The inclusion of four "types" of human life suggests there are four potentially different indifference curves, depending on which "type" of life is

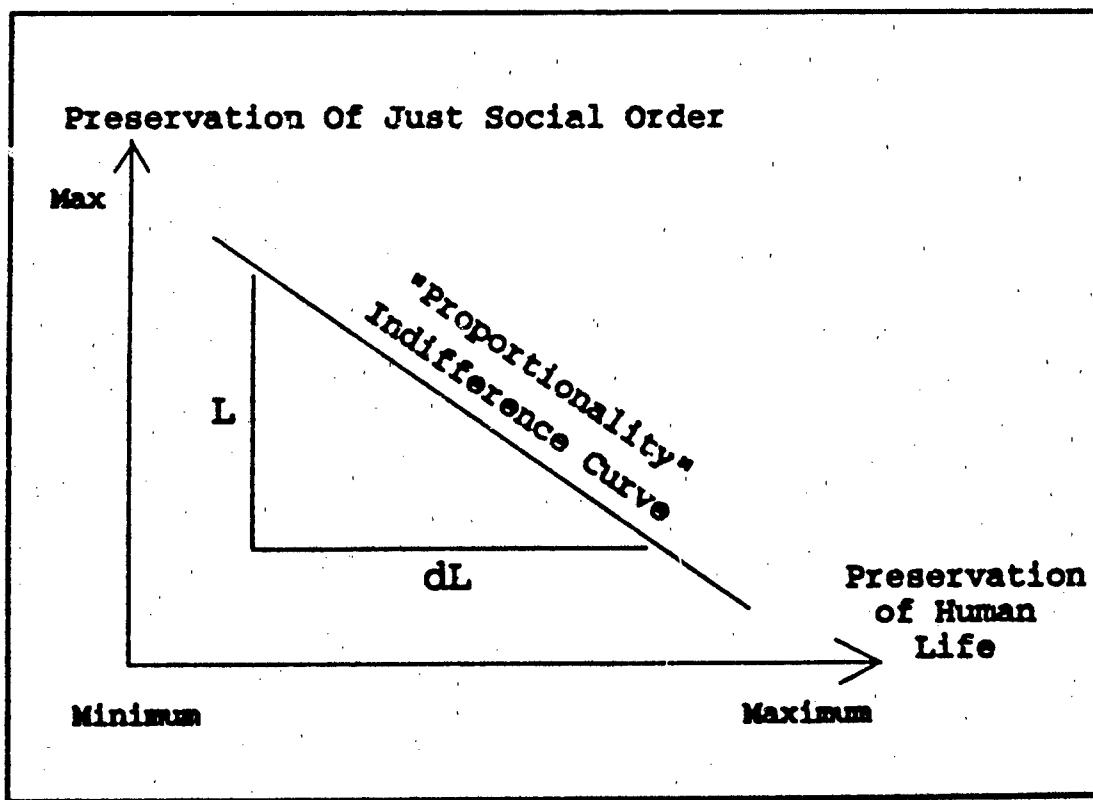


Figure 15. Proportionality Depicted

being considered. For example, enemy combatant lives would be traded off with less justification than enemy noncombatants.

Explanation of Discrimination. Discrimination as explained before encompassed two types of enemy noncombatant casualties, intentional and unintentional. From this point on, casualties will be referred to as "killed" to simplify the description, but the reader should remember this may include injured noncombatants as well. The division of discrimination suggests that the hierarchy should contain a further specification (Figure 16) of the noncombatant attribute into "intentionally killed" and "unintentionally

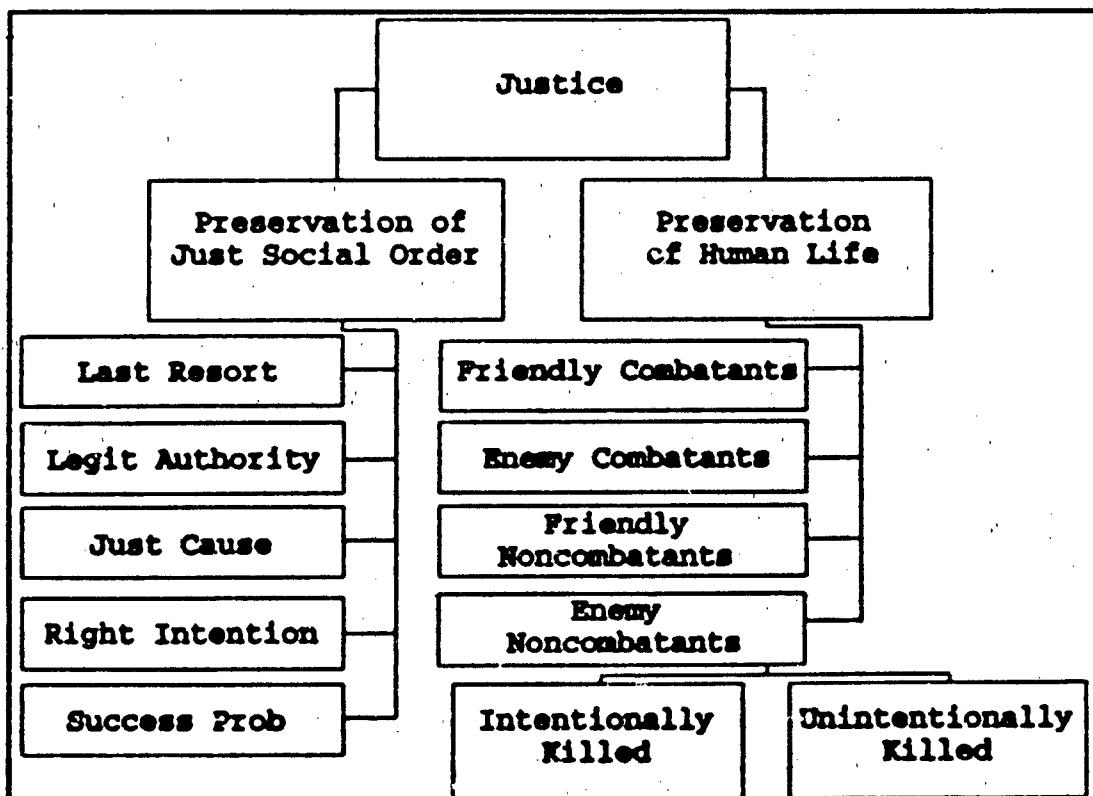


Figure 16. Specification of Noncombatants

killed." Note that at this level of specification these attributes have become negatively oriented, meaning a higher value is less desirable.

Discrimination is a description of the moral requirement that no noncombatants should be intentionally killed--essentially, any decision that involves intentionally killing noncombatants is not viable because it exceeds the acceptable level for that attribute. As discussed before, the "unintentionally killed" portion of discrimination, assuming the subjective definition of discrimination, requires that this attribute be proportional to the objective. This suggests yet another tradeoff (shown in figure 17) between the "preservation of society" objective and the "unintentionally killed enemy noncombatants" attribute, similar to Figure 15, but with a reversed orientation.

Summary Hierarchy. The hierarchy of objectives is now completed for the purposes of this thesis, and is summarized in Figure 18 on page 58. This figure is shown with the understanding that the hierarchy is not a complete representation of all the values considered in a decision. To be complete, it would have to show every human value, including rights to personal property, education of youth, freedom of action, and so on. The hierarchy shown is representative of the type of values considered (and traded off) but it is not exhaustive.

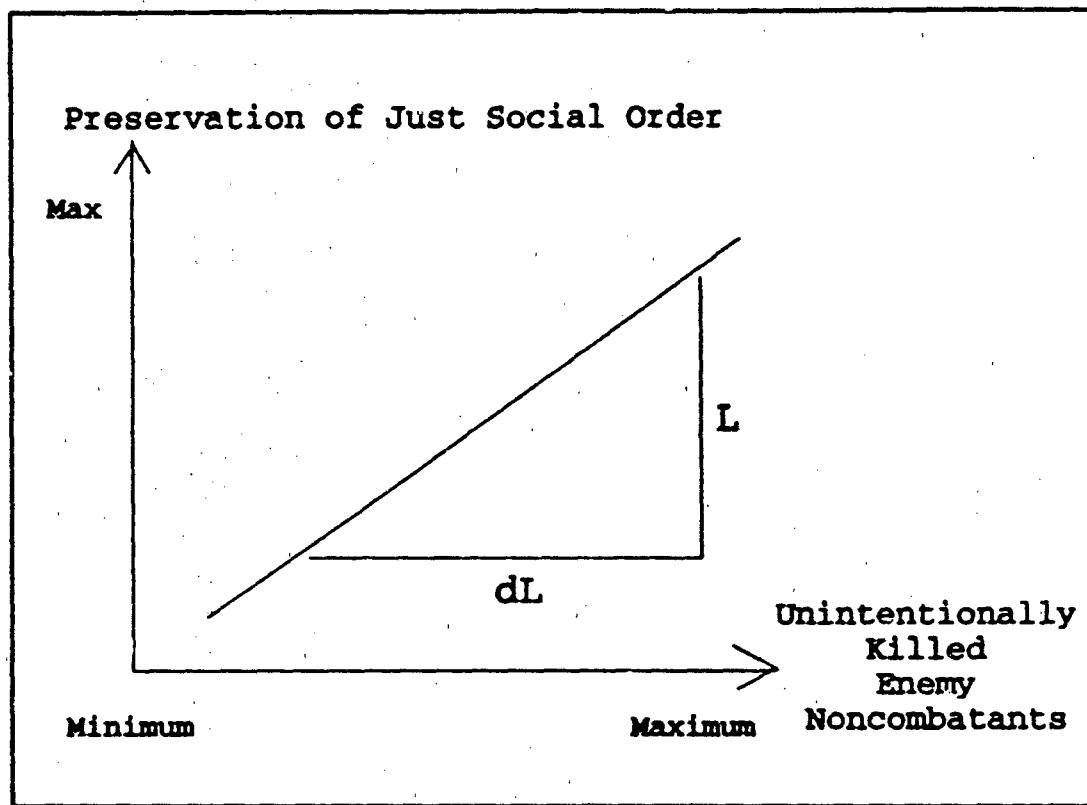


Figure 17. Proportionality for Discrimination

#### The Crucial Tradeoff

When justice and loyalty to the state are placed together on the hierarchy (Figure 18), the overall ethical tradeoff becomes obvious: conscience and the good of the state may disagree. Figure 19 shows this type of tradeoff: with "justice" on the vertical axis, and "loyalty to the state" on the horizontal axis, the military man may find that he is required to make tradeoffs between these two values. The best situation is one in which the loyalty and justice in an action are both high, and "The Good Life," the overall objective which subsumes these objectives, is readily achieved. As one or the other of these values goes

## Hierarchy of Objectives

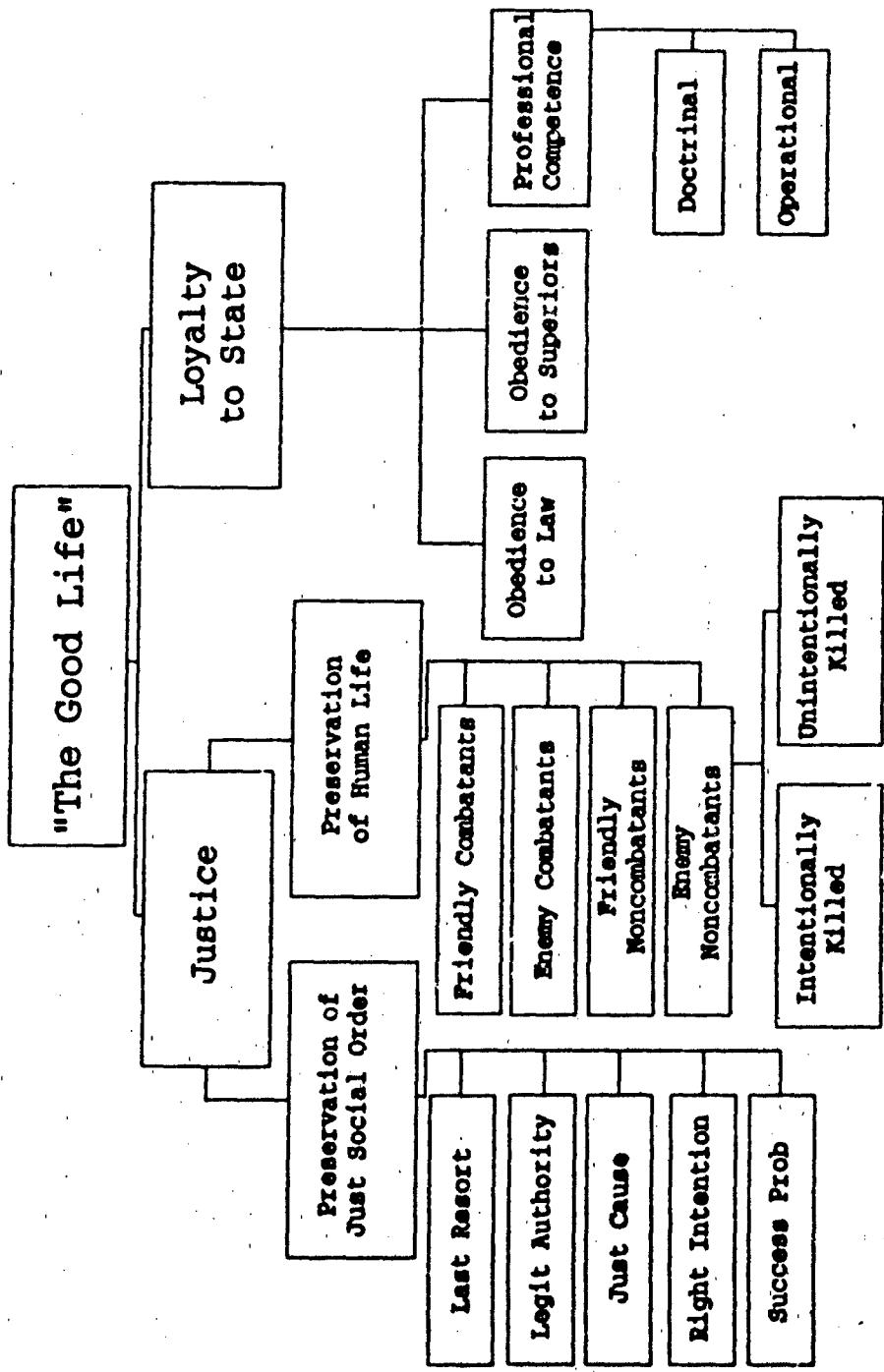


Figure 18. Completed Example Hierarchy

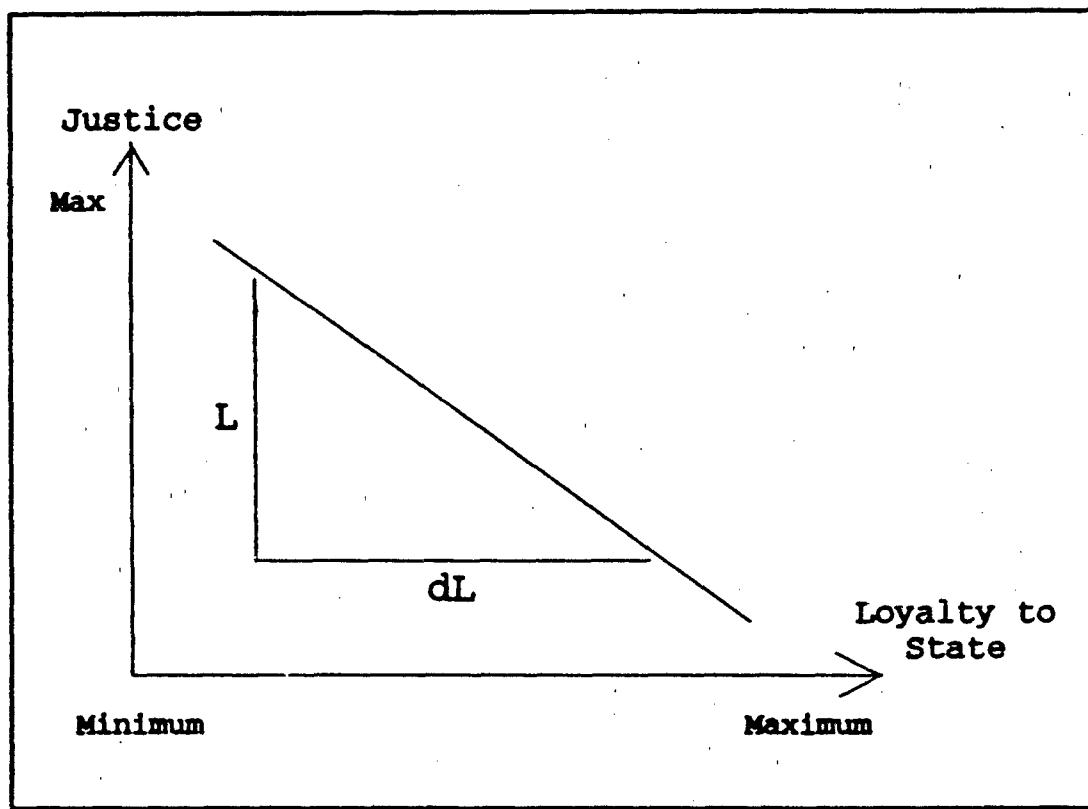


Figure 19. Crucial Tradeoff

down in a set of decision alternatives, however, the need for careful evaluation of moral tradeoffs becomes more crucial. The degree of evaluation required, and by whom, will be explored further after a more complete explanation of value-wise dependence.

Value-Wise Dependence

The value-wise dependencies, or goals which must be considered together, already discussed are summarized below:

Loyalty to the State vs. Justice

Obedience vs. Professional Competence

Obedience vs. Legality

Preservation of Life vs. Preservation of just social order

Unintentional Killing of Noncombatants vs. Preservation of just social order

The degree to which each of these values should be traded off with each other is reflected in hypothetical normative indifference curves. Thus in considering two goals together, and making a morally justifiable decision, the values of each alternative should fit on or exceed a normative indifference curve. An act is unjust if the mapping of the values involved does not meet the indifference curve. Thus, if there is a curve of moral indifference, it would be better named a "justification curve" or "moral responsibility" curve.

Example of a Normative Indifference Curve. The following example indicates this concept. Figure 20 shows a hypothetical indifference curve for two values, the unintentional killing of enemy noncombatants, and the preservation of society. Action A represents a justifiable action. For action A, a moral man agrees that K1 amount of noncombatants unintentionally killed can be justified by the value of the military action to society. Action B represents an unjustified act, in which K2 amount of noncombatants unintentionally killed cannot be justified by the value of the military action to the preservation of society. In traditional terms, action A is deemed proportionate, and action B is disproportionate.

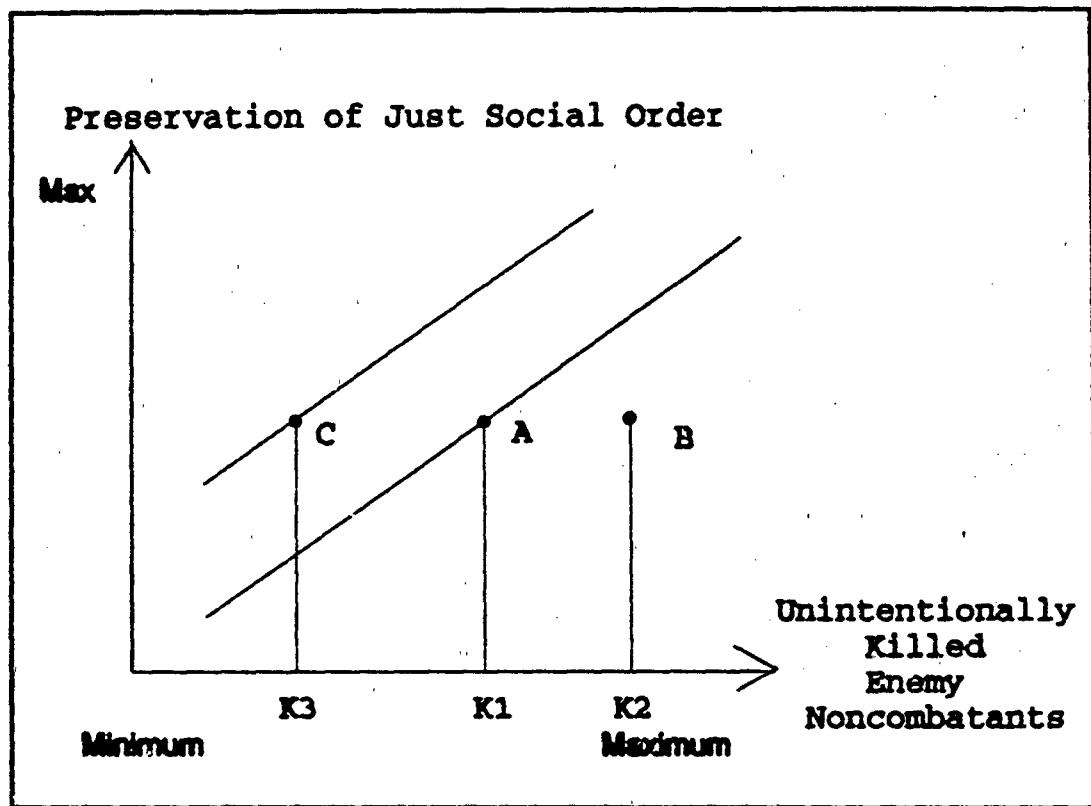


Figure 20. Normative Indifference Curves

Continuing this example, a third possibility is action C, which is the most desirable act; it is positioned on an improved indifference curve, one which has better values for both attributes. But this improvement must be considered together with the effectiveness of the action, because an act which has a high value in terms of justice may not serve the purposes of the state. The act should not be professionally incompetent, because that would be disloyal to the state, which is an important value. A lower indifference curve on the noncombatants vs. preservation of society graph would be accepted because a particular action will be professionally competent in supporting the goals of

the state. In a sense a three-dimensional tradeoff exists between noncombatants, preservation of society, and professional competence.

Use of Utility Functions. This tradeoff can be visualized two-dimensionally by using the concept of utility function. A function  $U$  which summarizes the preferability of a given indifference curve on the noncombatants vs. preservation of society tradeoff graph can be defined so the more preferable indifference curve would have a higher value in the function. The acceptance of the lower-value indifference curve referred to above would represent a tradeoff lying on an indifference curve on the graph of  $U$  vs. professional competence (Figure 21).

The concept of the utility function enables better understanding of the justice vs. loyalty to the state tradeoff. A function  $U'$  which summarizes the preferability of all the attributes under justice and another function  $U''$  which summarizes the attributes under loyalty to the state can be defined. The axes in Figure 19 are actually defined by these two functions.

A summary function  $Q$  which represents the degree to which an alternative advances "The Good Life" will be assumed, consisting of some combination of  $U'$  and  $U''$ . This function will be used in the following discussion of roles.

With this description of tradeoffs, the reader can see that creation of the utility function  $Q$  would be a complex task, hence it has been excluded from this thesis. The

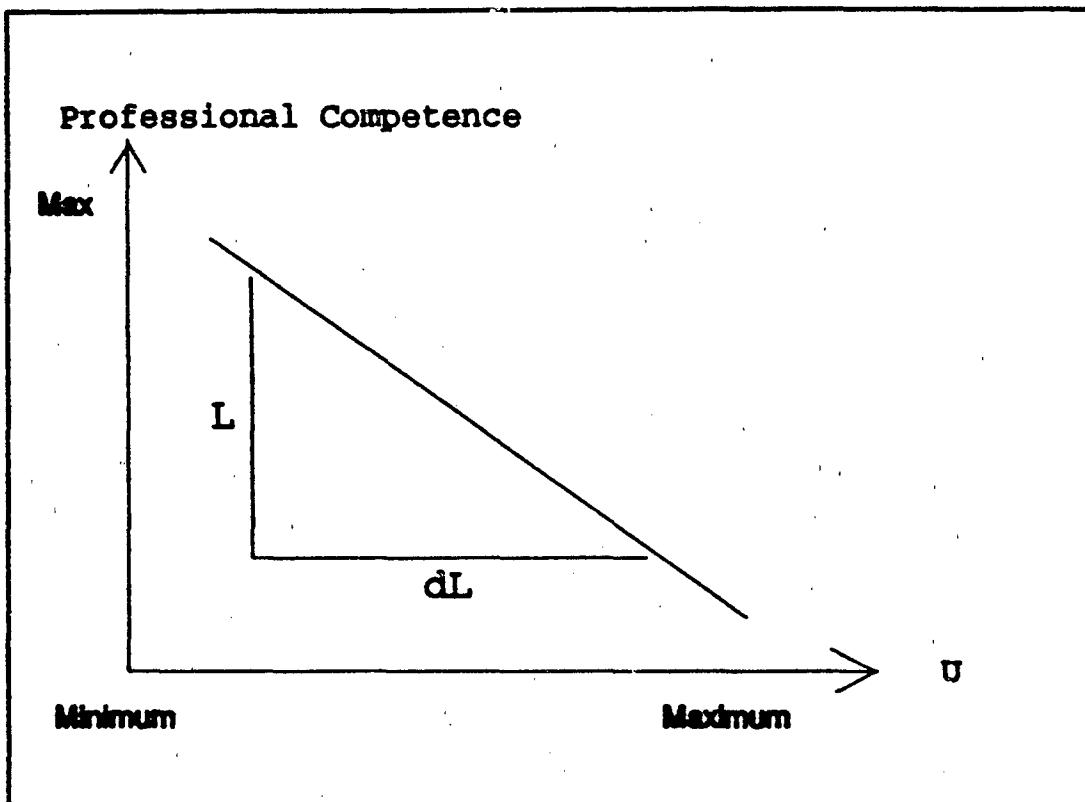


Figure 21. Utility Function Indifference Curve

important point is that such a function could be defined if the preferences and value structure of the decision-maker could be clearly identified.

Necessity for Tradeoffs. The reader may well question the necessity for tradeoffs in making decisions. In other words, why must the value of  $G$  be anything less than the maximum value in any situation? It appears that by requiring tradeoffs, a limitation on "The Good Life" has been introduced. The answer to the question is philosophical, because the real question is, "Do we assume evil in the world?" Rather than answer this query in general, in the context of this thesis, a simple statement

in decision-making terminology should be an acceptable explanation: in war, the objectives of the enemy do not coincide with yours. If no enemy existed, no resistance would be offered to the accomplishment of national objectives, and "The Good Life" would always be achieved. The reader will agree that this condition is desirable but certainly unrealistic. Hence the military man must do his job and make his tradeoffs, accepting that "The Good Life" is a goal rather than a reality.

#### The Effect of Individual Role on Value-Wise Dependence

The importance of the level of responsibility and role of the decision-maker on the ability to make tradeoffs has been mentioned in Chapter II. Now, with the definition of the hierarchy and description of its value-wise dependencies, this role effect can be fully explored.

In Chapter II, the literature review, it was stated that the leader, with a higher knowledge level and responsibility, is expected to make more careful value judgements than his subordinates, because of their relatively lesser knowledge and responsibility. In terms of the hierarchy of objectives, the subordinate (the soldier in the trench, say) is not expected to be capable of correctly judging the moral tradeoffs we have identified in multiple conflicting objectives. Thus justice considerations are expected to have less "weight" in the subordinate's decision-making process, and loyalty is his primary value.

In fact, at the lowest subordinate level, the soldier becomes almost one-dimensional and his overriding value is obedience. He is expected to instantly obey most of the time, unless the level of injustice is obvious. Because he is not as highly trained as the leader in consideration of complex value tradeoffs and because he has access to limited information, he is not expected to evaluate complex value tradeoffs. This relationship is shown in Figure 22.

The function G is useful in explaining this concept. A high level of G indicates that an alternative is both just and loyal to the state--that is, the soldier is obeying an

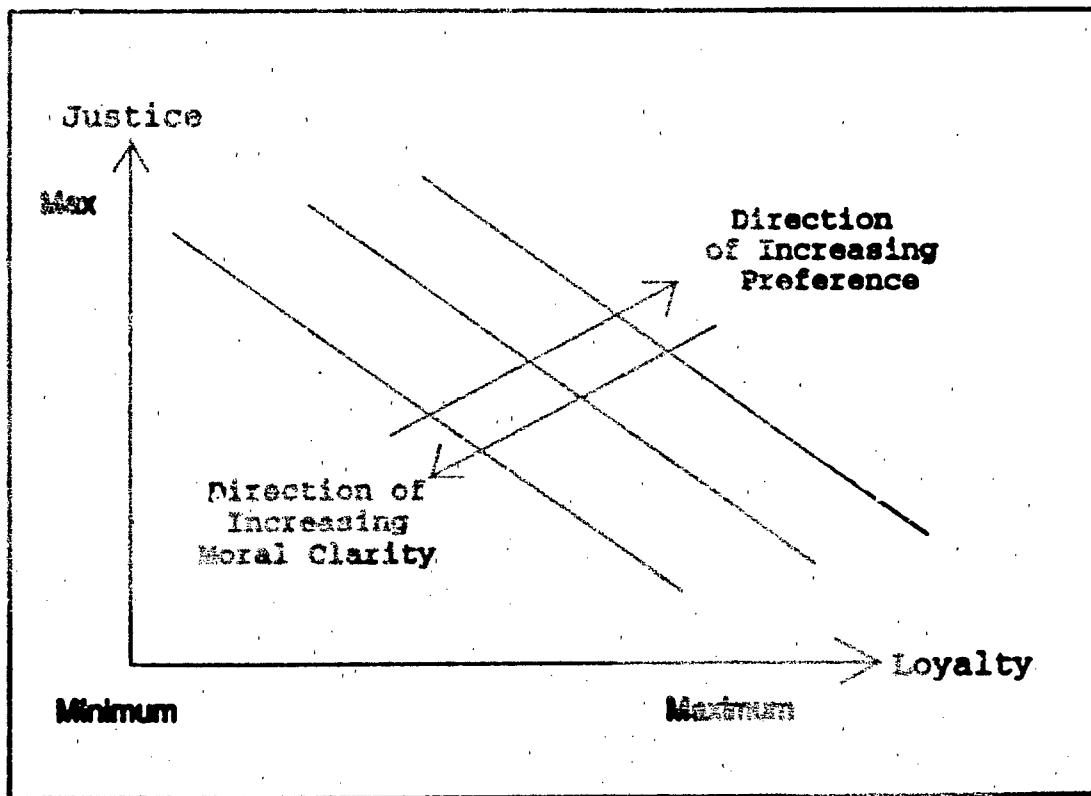


Figure 22. Relationship of Moral Clarity to Decision Situation

order which has high moral value. As the level of  $Q$  goes down for two alternatives, then the situation is not so simple, and justice and loyalty tradeoffs may potentially exist. At some point the existence of tradeoffs becomes obvious, and their evaluation relatively simple, most likely because of a low value of justice for a particular action. At this point the soldier is expected to evaluate tradeoffs and consider his normative indifference curves. The point where this evaluation begins is higher for the leader than the subordinate, and higher still for each succeeding level of leadership.

A familiar example from the Vietnam war readily illustrates this concept. In an incident known as the "My Lai Massacre," an Army lieutenant ordered the killing of noncombatant civilians in My Lai, a Vietnamese village. Some of his subordinates obeyed, and some did not. However, when this incident became a military court case (assuming a court represents normative values) only the lieutenant was accused of disobeying "the laws of war." Because he was the leader of the group, he was held responsible for this action, even though he did not actually commit the supposed crime. Those who obeyed his orders to kill noncombatant civilians were not held responsible for their actions because they were at the lowest subordinate level and not expected to make value judgements. It could be argued that this action was very obviously low on the  $Q$  scale but nonetheless a different standard was applied to

subordinates, at least by the court (Walzer, 1977: 309-310).

In this example appears the possibility that a soldier may correctly discern the low moral value of an order and make a conscious decision to disobey, misunderstand, or delay its execution. Obviously this behavior is morally desirable, but it is not expected. Returning to the definition of "expect," this situation takes on a strange moral character: either acting or not acting is morally justifiable. War creates a moral situation which confirms what the reader may already suspect, that military ethics is an unconventional and confusing branch of moral discourse.

To summarize the importance of the role dependency of indifference curves: both the subordinate and the leader have the same values, but they are expected to evaluate these values differently because of their different roles.

#### Chapter Summary

This chapter has defined a proposed hierarchy of values for military decision-making. This definition included the description of the value-wise dependencies between various attributes in the hierarchy and the effect of roles on the tradeoffs expected of various individuals. As explained in the literature review, the model can now be applied to a historical decision to evaluate its usefulness.

#### IV. Model Validation

##### Introduction

The hierarchy of objectives described in Chapter III attempts to capture the values involved in a military decision. It is an incomplete tool for decision-making for the following reasons:

1. The tradeoffs between values, because they involve moral values, are dependent on the individual decision-maker, so it is difficult to achieve a normative consensus in describing them. Recognition of the tradeoff is one matter, defining it precisely is another.
2. To the degree that exact descriptions of these tradeoffs are not available, the definition of a comprehensive value function is difficult.
3. The model ignores uncertainty in decision-making.

Even with these limitations in mind, development of the hierarchy benefits from a test by application. Recalling the simplified decision evaluation method introduced in the literature review, a historical decision can be analyzed in the context of the hierarchy of objectives.

##### Historical Decision Introduced

A historical situation has been chosen for two reasons. First, the outcomes of the decision are known exactly, at least for the alternative chosen originally, which coincides with our simplifying assumption of certainty. Secondly,

historical decisions have usually been "second-guessed" already, and by comparing this evaluation with those made previously, some degree of validation can be accomplished. The reader must realize that this is not a historical study, so the historical context will be simplified.

Because the original discussions leading to this thesis focused on the doctrine of strategic bombing, a historical example of the application of this doctrine is examined. The particular scenario revisited is the famous Schweinfurt raids of World War II, described in present tense to give the reader a sense of the importance of the decision.

#### Context of the Decision

The historical context of the Schweinfurt raids is fairly simple: it is 1943, and the Allied powers are engaged in a full-scale war with the Axis powers. One aspect of the Allied war effort is strategic bombing. The purpose of the strategic bombing in Germany is summarized in the Capabilities Directive, issued by the Allied Joint Chiefs of Staff. It is considered the guiding mission statement for the entire bomber offensive at the time:

To conduct a joint United States-British air offensive to accomplish the progressive destruction and dislocation of the German military, industrial and economic system, and the undermining of the morale of the German people to a point where their capacity for armed resistance is fatally weakened. This is construed as meaning so weakened as to permit initiation of final combined operations on the Continent. (Hansell, 1972: 168)

The breadth of this statement allows the Allied air forces (British and American) to formulate different interpretations of their mission. The British, because of previous heavy losses in daylight precision bombing missions, believe that "undermining of the morale of the German people" is the principal thrust, and hence emphasize nighttime "area" (population) bombing. The Americans, on the other hand, continue to believe in the viability of daylight precision bombing, and so choose to bomb selected industrial and military targets to achieve the "fatal weakening" (Hansell, 1972: 169-170).

One of the targets considered important by strategic planners is the ball-bearing industry of Germany. Ball bearings are critical to the engine industry, and it has been determined that Germany has limited alternate sources for the bearings (Hansell, 1972: 160). The ball bearing industry is concentrated in a few locations, most of it around Schweinfurt in south central Germany. The principal problem with Schweinfurt as a target is its distance from England, requiring a 900-mile round trip, which exposes bombers to hostile skies for six hours, and denies them fighter protection over much of that distance (Robinson, 1982: 342).

The Eighth Air Force of the United States Army Air Forces is stationed in England, with its principal mission to bomb selected targets in Germany (Robinson, 1982: 341). The Eighth is assigned the task of bombing Schweinfurt. A

plan is made to reduce the effect of enemy attacks: two wings of bombers will be sent, one which will attack Regensburg in Austria and draw off the German fighters, and a second which will actually bomb Schweinfurt.

The plan makes sense in theory, but in the first attempt, on 17 August 1943, bad weather causes the timing of the two wings to be off, and the "feint" effect is lost. The second wing loses 36 out of 230 B-17 bombers on its run to Schweinfurt and because a number of the losses are lead bombers, many of the bombs fall off-target (Robinson, 1982: 342-343). Even so, ball-bearing production is reduced by 35 percent (Hanseli, 1972: 213).

A second attack on the target is delayed by "other commitments and poor weather" until 14 October 1943. In this attack, the entire Eighth Air Force bomber establishment is committed, which results in 291 B-17 bombers departing England (Robinson, 1982: 343).

The attacks are much more successful this time, with "three of the five plants at Schweinfurt receiving heavy damage" (Robinson, 1982: 343). The attacks cause German bearing production to drop 67% (Grigg, 1980: 139), and it will take the industry six months to return to its original production levels. However, the toll on the force for this success is high: 60 B-17's are missing in action, five crash in England, and 133 are damaged. 600 men are reported missing, and there are five dead and 43 wounded on returning bombers. This loss rate is, for the bombers, "the highest

percentage loss to a major task force during their campaign" (Robinson, 1982: 343). The figures are so high that one writer refers to this raid as "the Schweinfurt massacre" (Macksey, 1987: 167).

### The Decision

The decision to be made is, "Do we attack Schweinfurt again?" Before fully exploring that decision, several assumptions must be made about the situation and the decision-maker:

1. There is a "unitary" decision-maker; without going through a historical exposition of command in World War II, it is assumed one military commander makes this decision.
2. This military commander has not been ordered to bomb Schweinfurt. He can bomb Schweinfurt or not and neither act will be considered disobedient.
3. Daylight bombing is acceptably accurate for 1943, so civilian casualties are not a factor in this decision.
4. The military commander is generally aware of what will happen in the future if Schweinfurt is not bombed immediately: the ball-bearing industry will be dispersed and Schweinfurt will cease to be a critical target. Another bombing raid on Schweinfurt now will devastate the ball-bearing industry, slowing down the German war machine significantly (Robinson, 1982: 343).
5. The United States is developing longer-range fighters so that long-distance targets like Schweinfurt will

be less dangerous. If the bombing is delayed until these fighters are available, the future raids will be less costly to friendly combatants (Hansell, 1972: 216).

With these assumptions in place, the two alternatives will be evaluated. Should the Eighth Air Force make another raid immediately, or wait until long-range bombing missions can be made more safely?

#### Decision Analysis

As Manheim and Hall did in their analysis, a preference for one alternative, or an identification of equivalence of both, will be made for each predictable goal. In figure 23, the code B will indicate a value preference for bombing Schweinfurt immediately, code N will show a preference for delaying the bombing, and an equals (=) sign will indicate no preference. After the predictable attributes have been evaluated, these results will be combined to make an evaluation of the unpredictable goals; that is, objectives which cannot be directly evaluated without considering the specified attributes.

First the equivalent predictable goals are identified. The "Preservation of Just Social Order" goal is considered equivalent for each action. Both actions would be undertaken in a situation in which society is greatly threatened, and so would have high value on this scale. Simply put, World War II was a justified war, the

### Hierarchy of Objectives

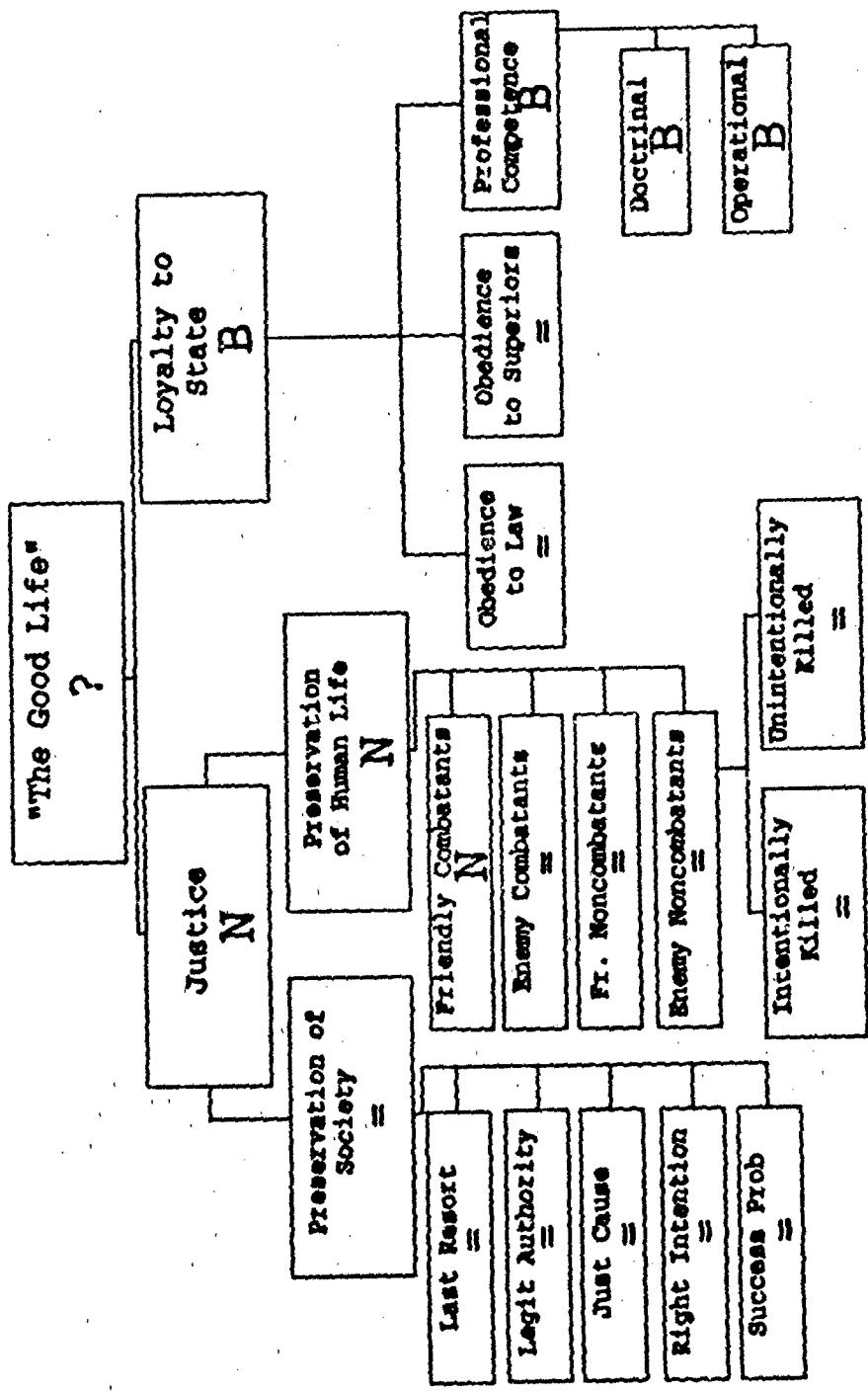


Figure 23. Decision Analysis in the Hierarchy

prosecution of which was of great value to the preservation of a just social order.

Assuming daylight bombing is accurate, the differences in killing of enemy combatants and noncombatants are minimal. Thus the values of these attributes are equivalent for both alternatives. As stated before, neither action is disobedient, so each has an equivalent value on the "obedience to superiors" attribute. In the same way, "obedience to law" will be assumed equivalent, in the sense that neither action is a war crime.

With these equivalencies out of the way, the differences will be defined. Considering the past losses on this dangerous mission, delaying the mission until long-range fighter protection is available has a much greater value to the preservation of "friendly" combatant (airman) lives. It follows by considering all the elements of the justice branch that delaying the mission has an overall value of justice greater than that of executing the mission now.

However, on the other side of the hierarchy, the professional competence of each alternative must be considered. Given that the decision-maker knows the attack will have the most impact if carried out immediately, and this impact will greatly advance the purposes of the state in the campaign ("fatally weakened"), bombing immediately has a higher value in terms of professional competence. Continuing to the previously unpredictable goal of loyalty

to the state, bombing immediately, or B is preferred to waiting, N.

Now what has been termed the "crucial tradeoff" is visible in a realistic situation. The crux of the decision has become: is the decrease in justice of "bombing now" acceptably traded-off with the gain in loyalty?

This concept is demonstrated by plotting B and N with potential tradeoff curves for the decision-maker, shown in Figure 24. Placing justice on the horizontal axis and loyalty on the vertical axis, the relative values of B and N options are plotted in relation to the indifference curves.

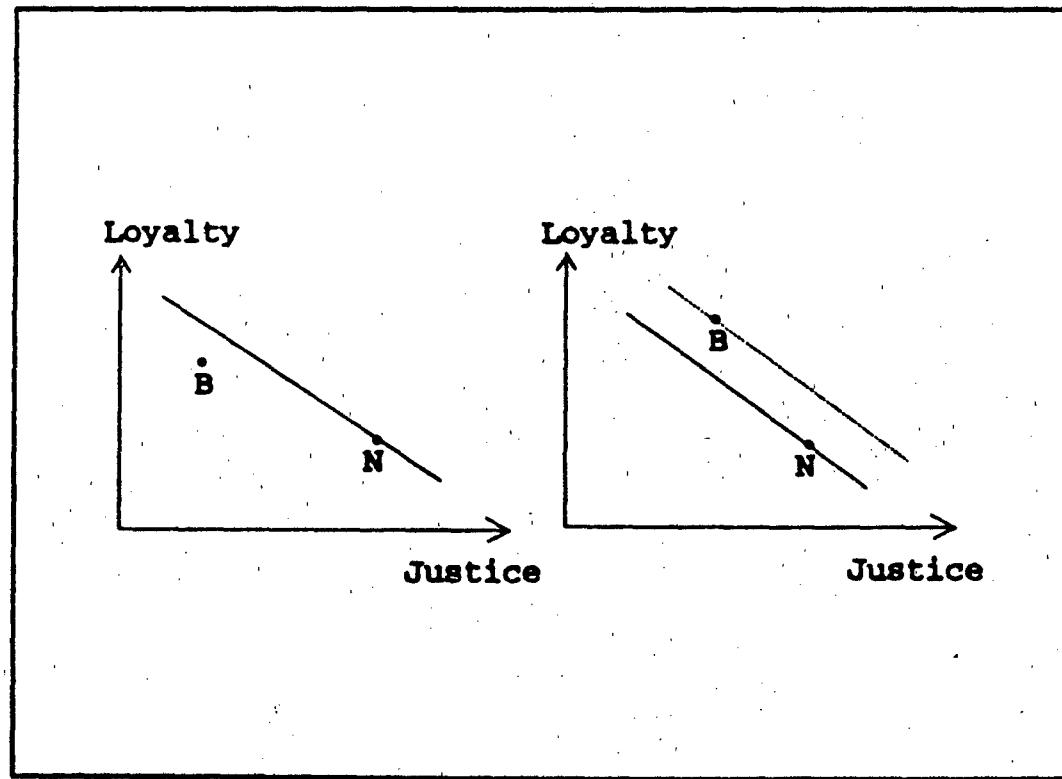


Figure 24. Possible Tradeoff Curves

The first graph in Figure 24 shows one possibility for B and N: N is on the hypothetical normative indifference curve, and B is not. That is, moving from N to B, the rate of decrease in justice sacrificed for the increase in loyalty is greater than the marginal rate of substitution for this decision-maker's indifference curve. Hence in this case, the decision-maker would choose not to bomb Schweinfurt immediately.

Another possibility is shown in the second graph of Figure 24. In moving from N to B, the normative indifference curve is exceeded, and alternative B is on an improved indifference curve. Thus in this case the decrease in justice is more than justified by the improvement in loyalty, and the decision-maker chooses to bomb Schweinfurt immediately. A third possibility is that both N and B reside on the decision-maker's normative indifference curve. In this case (certainly the exception) the alternatives exactly coincide with the marginal rate of substitution, keeping in mind that other decision-making factors not currently included in the hierarchy would have to be used, such as availability of resources, weather, etc.

Considering these possibilities against his personal values, the decision-maker believes that the decrease in justice from immediately bombing is not justified by the increase in loyalty, and he will delay the bombing raids (option N). Of course, another decision-maker may view the

same information and arrive at a different conclusion, but this decision-maker has made this analysis of the tradeoffs.

#### The Real Decision

In reality, the decision-maker did choose to delay the bombing of Schweinfurt until better fighter protection was available. Thus he considered the tradeoffs in N preferable to the tradeoffs in B.

Reviews of historical literature suggest the outlines of tradeoff evaluation in this decision. "The raids in October cut production by 67 percent, but by then the German defences were so well organised that the cost to the Americans reached, as we have seen, a deterrent level" (Grigg, 1980: 139). Grigg comments on the effectiveness lost by discontinuing the raids:

... the Americans came tantalisingly near to success at Schweinfurt, and they might have finished the place off if they had returned to the attack. This they might well have done if their bombers had been able to fly the whole distance there and back with fighter protection, instead of losing it halfway out. (Grigg, 1980: 139)

But the cost at the time was deemed too high: "Such losses were unacceptable, and it became obvious to the Americans that daylight bombing could not be continued without fighter cover all the way" (Grigg, 1980: 138).

Robinson echoes this "unacceptability" theme: "[This loss] convinced most dedicated supporters of the self-defence bomber mission that such tactics were no longer tenable" (Robinson, 1982: 343). But in recounting the actual

decision and what followed, Robinson also realizes the effectiveness traded-off:

Although the 14 October raid had considerable success, a follow-up attack could have had a more telling effect on the German war economy. The bearing complex was not attacked again until the following February and by this time the Germans had had time to disperse their bearing production to a number of smaller sites. While another 14 bombing raids were made on the Schweinfurt plants during the war, none caused so much disruption to the supply of ball-bearings as the first two strikes. (Robinson, 1982: 343)

Albert Speer, Hitler's Minister of Armaments and Munitions, provided the most telling account of the effectiveness of the attacks. After the war, he wrote of the "frightening" effect of the first raids on Schweinfurt. He recounted that "there was no alternative but to repair the facility [Schweinfurt plants] as rapidly as possible since to move it would hold up production for several months," and that frantic attempts to import from Sweden and Switzerland met with only slight success (Hansell, 1972: 215). "'What really saved us,' he wrote, 'was the fact that from this time on the enemy, to our astonishment, once again ceased his attacks on the ball-bearing industry'" (Hansell, 1972: 215). When asked about the effect if "concerted and continuous" attacks on the industry had been made, Speer replied:

Armaments production would have been crucially weakened after two months and after four months would have been brought completely to a standstill. (Hansell, 1972: 215)

Obviously, considerable effect towards national objectives was traded off in this decision, but the tradeoff was a rational one:

That the bombing was more efficient and effectual by day than night cannot be denied. But this leaves the question of excessive losses unanswered. Statistically 19 per cent of the Fortresses which attacked Regensburg-Schweinfurt [the first time] did not return from those targets . . . . That is, nearly a fifth of the attacking force was lost that day, a loss ratio that could not have continued. The answer to that lay in the long-range escort fighter. (Jablonski, 1974: 187-188)

Although Jablonski's comments refer to the August raids, the principles apply to both. Clearly historians agree that a justifiable tradeoff was made in the decision to delay further bombing of Schweinfurt.

This review of applicable literature reveals an important lesson of the hierarchy of objectives, that ethical considerations are often imbedded in what appears to be an operational decision. Use of the hierarchy in this situation makes the reader conscious that ethics are an integral part of most military decisions, whether the principles involved are explicitly stated or implicitly understood.

### Conclusion

This example demonstrates the validity of the hierarchy of objectives as an analytical aid in understanding the types of tradeoffs made in real military decisions. The necessity for numerous simplifications to complete the

example in a practical discussion also shows the complexity of military decision-making.

## V. Conclusions and Recommendations

### Introduction

The preceding chapters defined and tested a hierarchy of objectives containing the values important in military decision-making. This chapter summarizes the salient points of the model, describes uses for the model in its current form, and recommends future research to refine and expand the model.

### Summary

Chapter II of this thesis established a basis of generally accepted ethical values for military decisions. With the assumption that such decisions are subject to conflicting objectives, it was determined these values can be placed into a hierarchy of objectives consistent with the concepts of multiple-criteria decision-making. This chapter also analyzed Capt Kidd's ethical threshold model using these concepts, concluding that the model was a general description of the types of value tradeoffs present in military situations. Chapter III developed the hierarchy of objectives, recognizing the values included were representative but not exhaustive. Chapter III also identified and graphically depicted the tradeoffs often required in military decisions, as well as the effect of organizational roles in the consideration of these tradeoffs. Chapter IV applied the hierarchy to a historical

military decision to verify the model's relevance in a realistic situation.

This summary points up the principal accomplishment of this thesis: the placement of ethical principles into an orderly conceptual framework to aid understanding and discussion of ethical problems.

#### Application

A point introduced in the development of the model is that military leaders are expected to be trained in the application of ethical principles to decision-making. Kidd recommended that his model be used to assist in conceptualization of ethical principles in professional military education. Because the hierarchy of objectives is a further refinement of the ethical threshold model, the recommendation applies to it as well:

"RECOMMEND: Incorporation of the model concepts into professional military education (PME), especially Squadron Officer's School" (Kidd, 1986: 66).

The analysis of Chapter IV provides an example of the use of the model in an instructional situation. As stated in Chapter IV, application of the model cultivates awareness of the ethical aspects of decision-making situations. In a forum of discussion, the hierarchy establishes a framework for rational argument, giving the members of a group something to "point at" when discussing an ethical problem.

Although the examples used in this thesis have been combat situations, ethical dilemmas at every level of military activity would benefit from further study. The fields of logistics and acquisitions contain many examples of this type of situation. For instance, appropriations of government funds may involve conflicts between obedience and professional competence, where competence would be defined as proper use of funds. Numerous other examples of ethical conflicts could be "mapped" onto the hierarchy of objectives to aid in ethical decision-making.

Hence the hierarchy of objectives at its current state of development is an instructional tool. However, with additional research as described in the next section, the full potential of the model can be realized.

#### Further Research

As stated in Chapter III, the hierarchy is a representative but not exhaustive listing of values. In addition, values are specified only in general terms, with a limited specification down to the level of measurable attributes. The hierarchy would benefit from theoretical study into other candidates for inclusion in the model, and also from inquiry into specific attributes which comprise the general objectives.

RECOMMEND: Expansion of the model by examination of other values which should be represented and specific

attributes which provide quantitative measurement for the general objectives currently included.

Chapter IV alluded to the difficulty of finding a "normative consensus" on ethical value principles and tradeoffs. While this is difficult, it is not impossible, and investigation into this area of human behavior would be fruitful. More specifically, an analysis of the significance of obedience in military decision-making would lead to conclusions about the effect of the military structure on ethical behavior.

RECOMMEND: Future research to investigate the ethical tradeoffs currently experienced by Air Force personnel, to include surveys or interviews to estimate the indifference curves proposed by this thesis.

Definition of the value structure of the decision-maker is a necessary prerequisite to the establishment of a utility function, and the continuation of this research as described above would logically lead to the definition of a value function. This function could be used in a decision support system (DSS) to aid decision-makers in evaluating complex problems.

RECOMMEND: Use of the hierarchy of objectives to establish a utility function for application in a DSS.

Chapter III of this thesis assumed the necessity for tradeoffs, and attempted to briefly explain why they are necessary. Verbal discussion of this point through the development of the model also included the effect of

technology on the ability to make ethical decisions. On the one hand, the incredible power of modern weapons appears to make it difficult to fight a war ethically. On the other hand, developments such as "smart bombs" and other highly accurate weapons seem to limit the unnecessary killing to achieve military objectives. In other words, high technology may enable the decision-maker to decide on a preferred indifference curve previously unattainable.

RECOMMEND: The effect of technology on the ethics of warfare be researched within the context of the hierarchy of objectives.

These recommendations for the refinement and application of the hierarchy of objectives reflect the ongoing nature of the research process. Just as the hierarchy of objectives built on the initial insights of the ethical threshold model, future work in military ethics may benefit from the ideas of this thesis.

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Vita

First Lieutenant Lowell A. Nelson was born on 14 May 1965 in Selma, Alabama. He graduated from Briarwood Christian High School in Birmingham, Alabama in 1983. He continued his education at Duke University in Durham, North Carolina, receiving a Bachelor of Science in Mechanical Engineering in May 1987. He was commissioned in the USAF through the ROTC program at the same time and came into active service in January 1988. His first assignment was to the 379th Civil Engineering Squadron at Wurtsmith AFB, Michigan, where he began his career as a mechanical design engineer. In October 1988 he became Chief of Heavy Repair, directing work orders for the improvement and maintenance of the base facilities. He moved to the position of squadron Readiness Officer in December 1989 and served there until entering the School of Systems and Logistics, Air Force Institute of Technology, in May 1990.

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